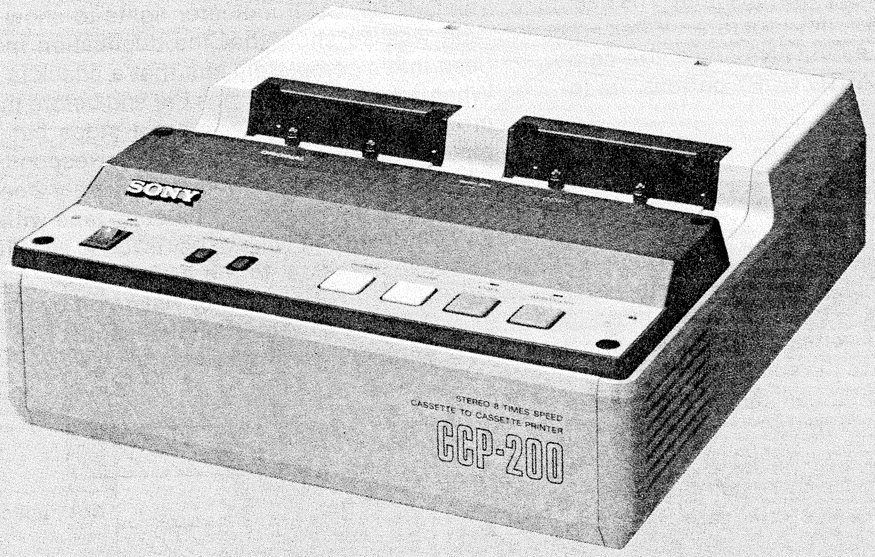
CCP-200

US Model
AEP Model



CASSETTE TO CASSETTE PRINTER

LUBRICATION AND INTERNAL CHECK

Periodical lubrication and internal check after about 10,000 cassette duplications or once every six months are recommended to maintain optimum performance of this high-speed printer.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SONY®

SERVICE MANUAL

SECTION 1
OPERATION

1-1. SPECIFICATIONS

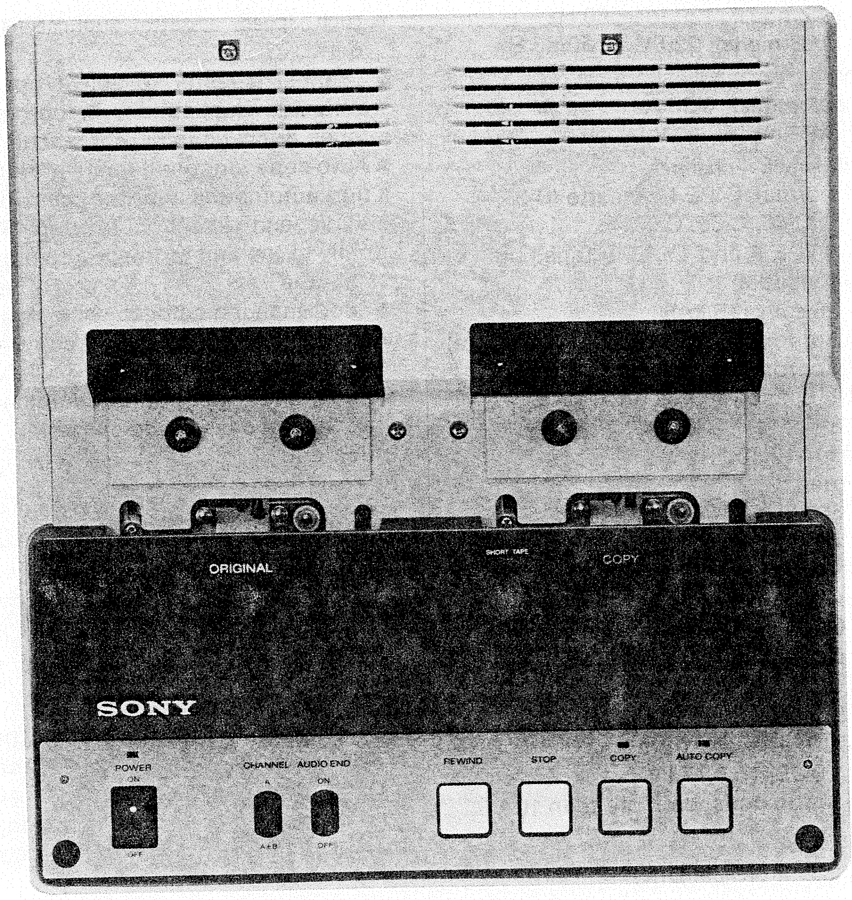
Power requirements	US model: 120 V ac, 60 Hz AEP model: 220 V ac, 50/60 Hz
Power consumption	US model: 0.35 A AEP model: 30 W
Recording system	4-track 4-channel
Tape cassette	Normal TYPE I cassette (C-30, C-46, C-60, C-90) (TYPE II and TYPE IV tapes not usable)
Tape speed	38 cm/s (15 ips)
Copy time	Approx. 4 min. (with C-60 cassette)
Rewind time	Approx. 1 min. 20 sec. (with C-60 cassette)
Frequency response	30–12,500 Hz
Recording bias frequency	600 kHz
S/N	Better than 50 dB (NAB-A: WRMS)
Total harmonic distortion	Within 3 %
Wow and flutter	0.2 % (WRMS)
Crosstalk	Better than 50 dB (between track 2 and 3, at 1 kHz)
Outputs	Line outputs (13-pin DIN) output level 0 dBm 0 dBm = 0.775 V load impedance more than 10 kΩ
Drive control connector	Output (13-pin DIN)
Dimensions	Approx. 310 × 111 × 325 mm (w/h/d) including projecting parts and controls
Weight	Approx. 7.2 kg

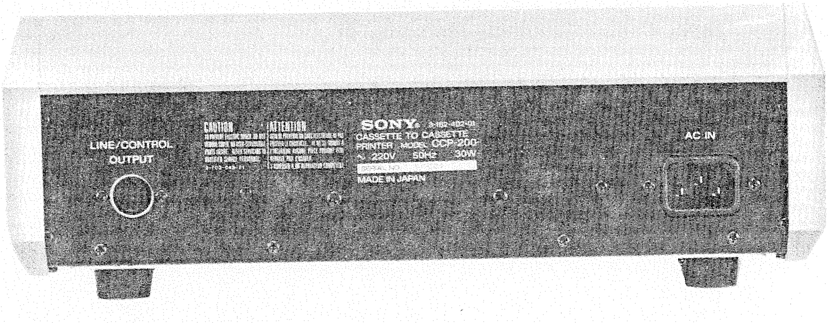
1-2. FEATURES

- High speed cassette duplication at 8 times normal speed.
- Channel selector to select one-side duplication or both-side duplication. In both-side duplication, all tapes are rewound automatically.
- Auto-copy function to activate a series of tape operation automatically at the press of a button.
- Audio end detection to stop duplication automatically at the end of the program recorded on the original tape.
- Short tape indicator to show that duplication may be uncomplete due to a short copy tape and that a check is required.
- Audio and control output terminals for connecting an additional cassette to cassette printer with copy section only.

1-3. EXTERNAL VIEW

Photo: AEP model


ORIGINAL
SHORT TAPE
COPY
SONY
POWER
ON
OFF
CHANNEL
R
A+B
AUDIO END
ON
OFF
REWIND
STOP
COPY
AUTO COPY


LINE/CONTROL
OUTPUT
CAUTION
ATTENTION
SONY
CASSETTE TO CASSETTE
PRINTER MODEL CCP-200
220V 50Hz 30W
MADE IN JAPAN
AC IN

Note that the panel indication of the selector switch for both-side duplication or one-side duplication has been changed from CHANNEL to SIDE SELECT during manufacture.

1-4. FUNCTION OF CONTROLS

CASSETTE DETECTOR SWITCH

Detect whether a cassette is inserted or not. The deck without a cassette does not operate. When no cassette is inserted in the ORIGINAL cassette compartment, the COPY and AUTO COPY buttons are inoperative.

AUDIO END DETECTION

When the AUDIO END switch is set to ON, the audio signals recorded on the original tape are detected during duplication. If there is a blank space of more than two seconds (32 seconds of normal playback time) on the original tape, it is treated as the end of the program, and duplication will stop automatically and the original and copy tapes will stop or be rewound.

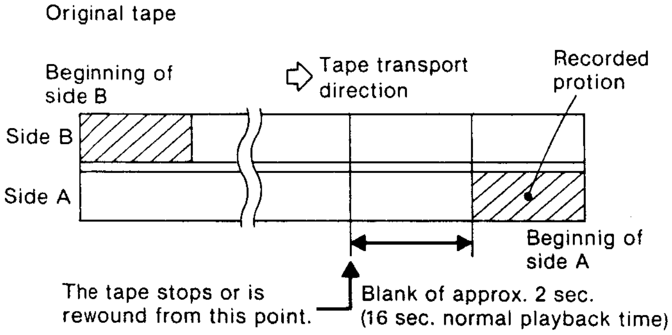
- The audio end detection works for the side being duplicated when the CHANNEL selector is set to A, or for both sides when the selector is set to A+B.

Note

The audio end detection may malfunction in the following cases and stop duplication in the middle of the program. In such a case, set the AUDIO END switch to OFF.

— when there is a blank of more than 16 seconds normal playback time or a program of very low volume level continues for the above duration.

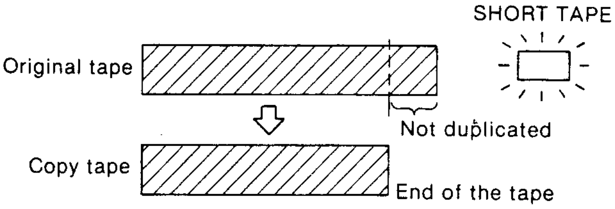
—when duplicating both sides of an original tape which is prerecorded only at the beginning of each side.


Original tape
Beginning of side B
Tape transport direction
Recorded protion
Side B
Side A
Beginnig of side A
The tape stops or is rewound from this point.
Blank of approx. 2 sec. (16 sec. normal playback time)

SHORT TAPE INDICATOR

The SHORT TAPE indicator lights to show that a copy tape was so short that the duplication may not have been made completely and that a check is required. When a copy tape reaches the end before the end of the program of the original tape, it stops but the original tape continues running. The corresponding SHORT TAPE indicator will light approximately 2 seconds after the end of the program. The copy tape with its SHORT TAPE indicator lit will not be rewound even if the CHANNEL selector is set to the A+B position.

The SHORT TAPE indicator will go off by removal of the copy cassette or the original cassette.

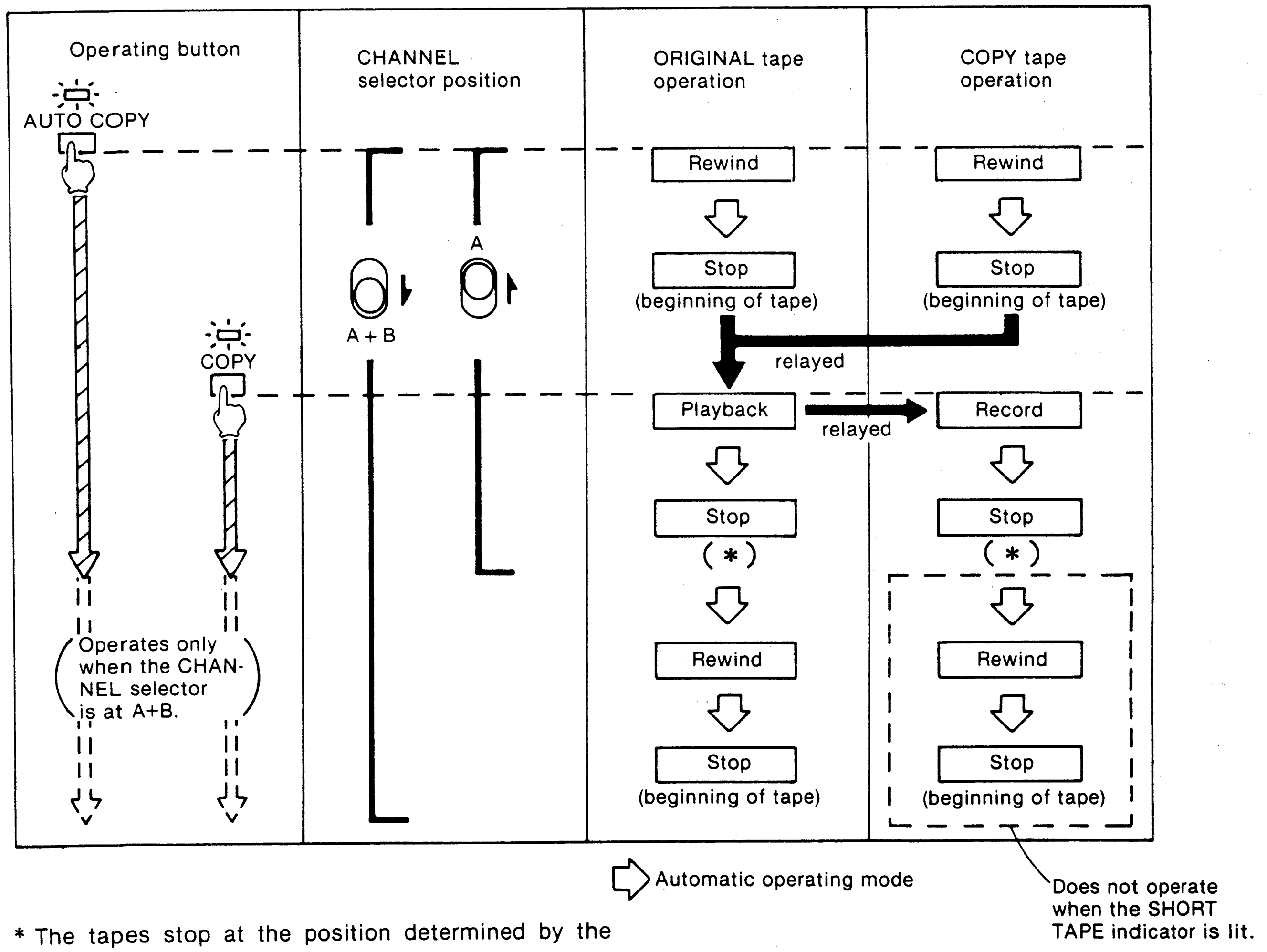

SHORT TAPE
Original tape
Not duplicated
Copy tape
End of the tape

Note

When a copy tape reached the end just a moment after the end of the program of the original tape, the SHORT TAPE indicator may light even if duplication is complete. To confirm duplication, playing back near the end of the copy tape using a cassette recorder is recommended.

TYPICAL OPERATING CONDITIONS

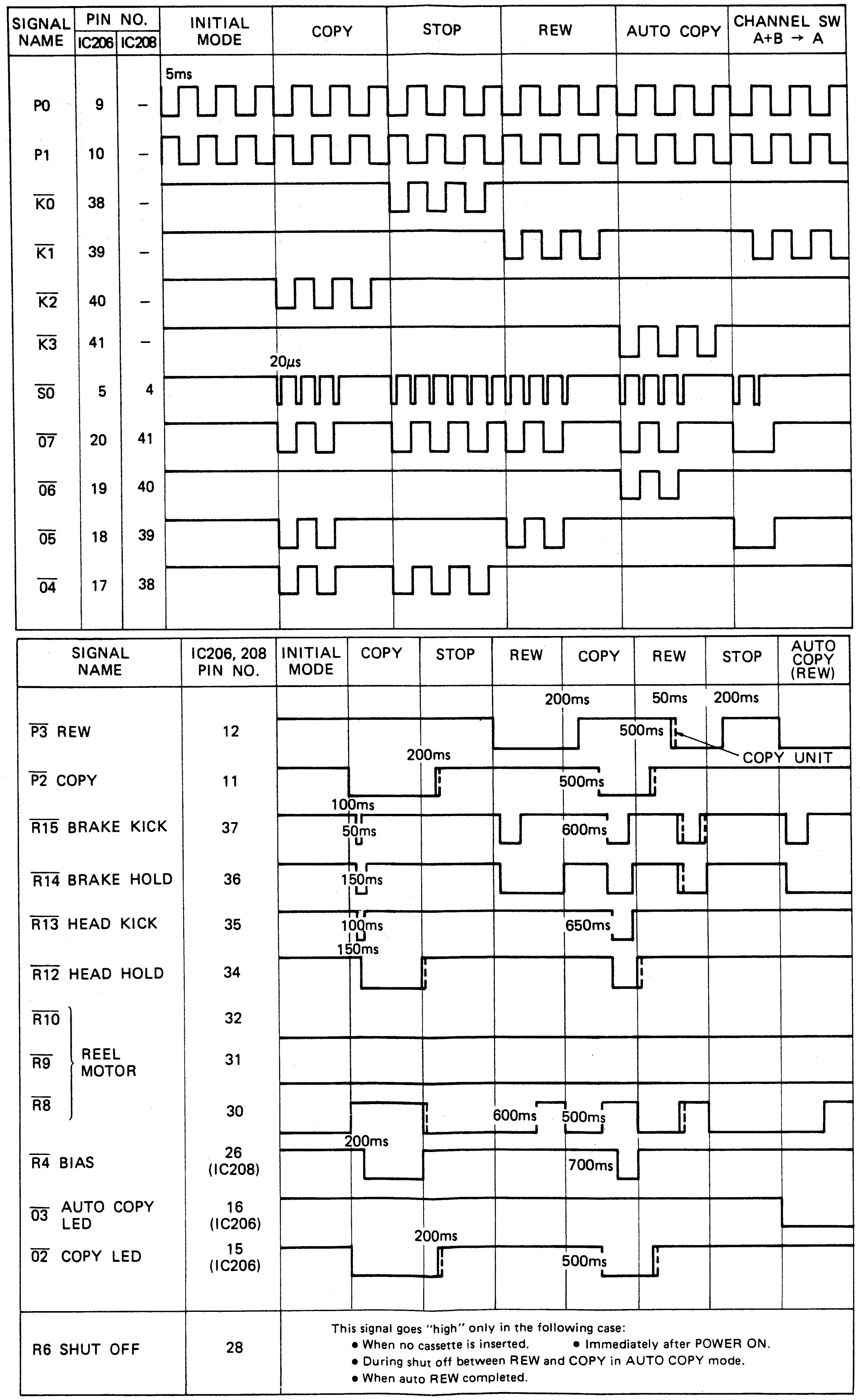
When the AUTO COPY or COPY button is pressed, the operation of the original and copy tapes is controlled as in the following table in accordance with the CHANNEL selector and AUDIO END switch settings and the state of the SHORT TAPE indicator.


Operating button
AUTO COPY
COPY
CHANNEL selector position
A + B
A
ORIGINAL tape operation
COPY tape operation
Rewind
Stop (beginning of tape)
relayed
Playback
Record
relayed
Stop
(*)
Rewind
Stop (beginning of tape)
Operates only when the CHANNEL selector is at A+B.
Automatic operating mode
Does not operate when the SHORT TAPE indicator is lit.

* The tapes stop at the position determined by the AUDIO END switch setting.
AUDIO END OFF: at the end of each tape
AUDIO END ON: approx. 2 seconds after the program of the original tape ends

SECTION 2
CIRCUIT DESCRIPTION

2-1. TIMING CHART

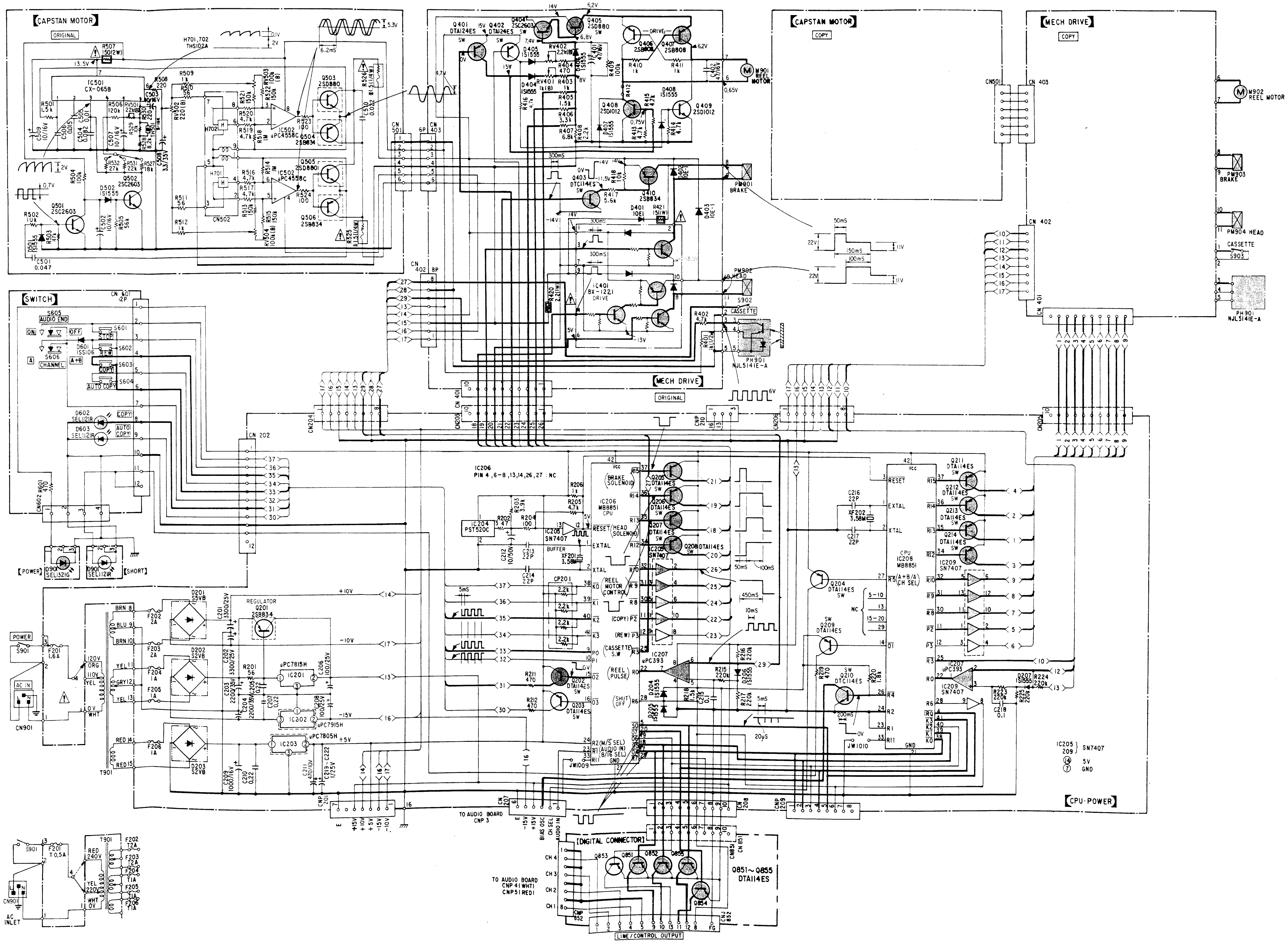

SIGNAL NAME
PIN NO.
IC206
IC208
INITIAL MODE
COPY
STOP
REW
AUTO COPY
CHANNEL SW A+B → A
5ms
20μs
P0 9 –
P1 10 –
K0 38 –
K1 39 –
K2 40 –
K3 41 –
S0 5 4
07 20 41
06 19 40
05 18 39
04 17 38
SIGNAL NAME
IC206, 208 PIN NO.
INITIAL MODE
COPY
STOP
REW
COPY
REW
STOP
AUTO COPY (REW)
P3 REW 12
P2 COPY 11
R15 BRAKE KICK 37
R14 BRAKE HOLD 36
R13 HEAD KICK 35
R12 HEAD HOLD 34
R10 32
R9 31
R8 30
REEL MOTOR
R4 BIAS 26 (IC208)
03 AUTO COPY LED 16 (IC206)
02 COPY LED 15 (IC206)
R6 SHUT OFF 28
200ms
50ms
200ms
500ms
COPY UNIT
200ms
500ms
100ms
50ms
600ms
150ms
100ms
650ms
150ms
600ms
500ms
200ms
700ms
200ms
500ms

This signal goes "high" only in the following case:
- When no cassette is inserted.
- Immediately after POWER ON.
- During shut off between REW and COPY in AUTO COPY mode.
- When auto REW completed.

2-2. OPERATING STATE

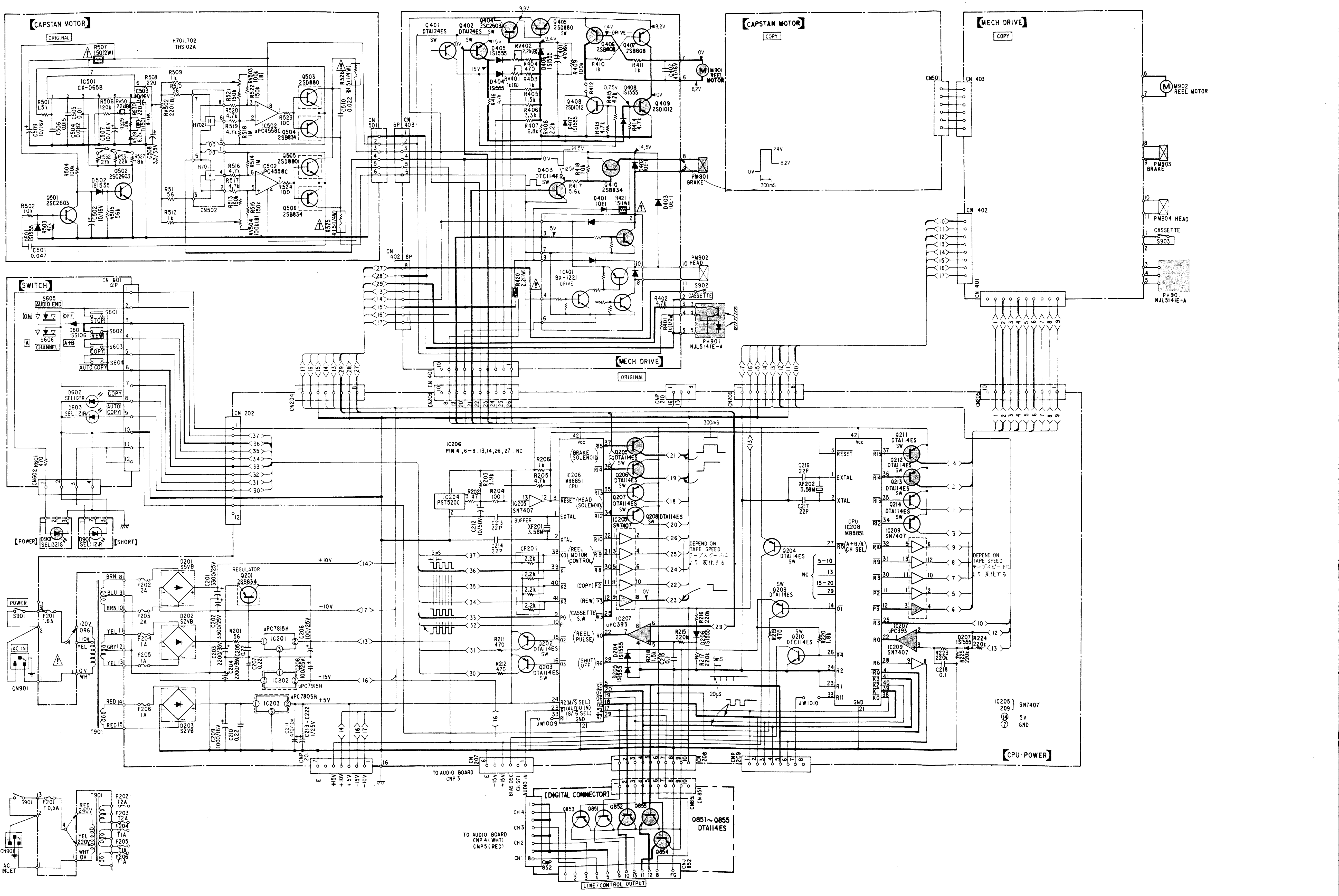
▬ ; Operating or high portion
▬ ; Operating or low portion

STOP → COPY


CAPSTAN MOTOR
ORIGINAL
IC501 CX-065B
IC502 uPC4558C
H701,702 THS102A
Q501 2SC2603
Q502 2SC2603
Q503 2SD880
Q504 2SB834
Q505 2SD880
Q506 2SB834
CN502
CN 501
CN 403
MECH DRIVE
ORIGINAL
Q401 DTA124ES
Q402 DTA124ES
Q404 2SC2603
Q405 2SB880
Q406 2SB808
Q407 2SB808
Q408 2SD1012
Q409 2SD1012
Q403 DTC114ES
Q410 2SB834
IC401 BX-1221 DRIVE
M901 REEL MOTOR
PM901 BRAKE
PM902 HEAD
S902 CASSETTE
PH901 NJL5141E-A
CN 402
CN 401
CAPSTAN MOTOR
COPY
CN501
CN 403
MECH DRIVE
COPY
M902 REEL MOTOR
PM903 BRAKE
PM904 HEAD
CASSETTE S903
PH901 NJL5141E-A
CN 402
CN 401
SWITCH
CN 601 12P
S605 AUDIO END
S601
S602
S603
S604
S606 CHANNEL
STOP
COPY
AUTO COPY
D601 1S1555
D602 SEL1121R
D603 SEL1121R
D901 SEL1321G
D902 SEL1121R
POWER
SHORT
CN602
CN 202
CN204
CN203
CNP 206
CN205
CN207
POWER S901
F201 1.6A
AC IN
CN901
T901
F202 2A
F203 2A
F204 1A
F205 1A
F206 1A
D201 S5VB
D202 S2VB
D203 S2VB
REGULATOR Q201 2SB834
IC201 uPC7815H
IC202 uPC7915H
IC203 uPC7805H
+10V
-10V
+15V
-15V
+5V
CNP 201
IC204 PST520C
IC205 SN7407
IC206 MB8851 CPU
IC206 PIN 4,6-8,13,14,26,27 : NC
XF201 3.58M
CP201
Q205 DTA114ES
Q206 DTA114ES
Q207 DTA114ES
Q208 DTA114ES
Q202 DTA114ES
Q203 DTA114ES
IC207 uPC393
BRAKE SOLENOID
HEAD SOLENOID
REEL MOTOR CONTROL
CASSETTE S.W
REEL PULSE
SHUT OFF
R2(M/S SEL)
R3(AUDIO IN)
R1(B/B SEL)
IC208 MB8851 CPU
XF202 3.58M
Q211 DTA114ES
Q212 DTA114ES
Q213 DTA114ES
Q214 DTA114ES
Q204 DTA114ES
Q209 DTA114ES
Q210 DTC114ES
IC209 SN7407
IC207 uPC393
R5(A+B/A) (CH SEL)
JW1010
JW1009
IC205 } SN7407
209
⑭ 5V
⑦ GND
CPU·POWER
CNP 209
CN 208
TO AUDIO BOARD CNP 3
DIGITAL CONNECTOR
Q851~Q855 DTA114ES
CH 4
CH 3
CH 2
CH 1
CNP 852
CNJ 852
CN 851
LINE/CONTROL OUTPUT
TO AUDIO BOARD CNP 4(WHT) CNP5(RED)
S901
F201 T0.5A
RED 240V
YEL 220V
WHT 0V
F202 T2A
F203 T2A
F204 T1A
F205 T1A
F206 T1A
CN901
AC INLET

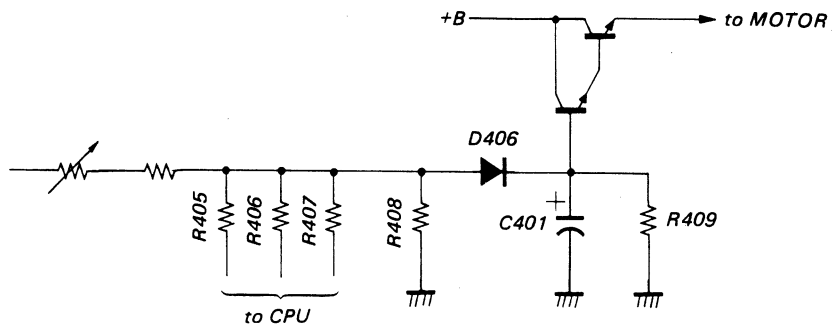
CCP-200 CCP-200

STOP → REWIND


[CAPSTAN MOTOR]
ORIGINAL
IC501 CX-065B
IC502 uPC4558C
H701,702 THS102A
[SWITCH]
S605 AUDIO END
S606 CHANNEL
D602 SEL1121R
D603 SEL1121R
COPY
AUTO COPY
[POWER]
[SHORT]
POWER S901
AC IN
CN901
T901
REGULATOR Q201 2SB834
IC201 uPC7815H
IC202 uPC7915H
IC203 uPC7805H
[MECH DRIVE]
ORIGINAL
M901 REEL MOTOR
PM901 BRAKE
PM902 HEAD
S902 CASSETTE
PH901 NJL5141E-A
IC401 BX-1221 DRIVE
[CAPSTAN MOTOR]
COPY
[MECH DRIVE]
COPY
M902 REEL MOTOR
PM903 BRAKE
PM904 HEAD
CASSETTE S903
PH901 NJL5141E-A
IC206 PIN 4,6-8,13,14,26,27 NC
IC204 PST520C
IC206 M88851 CPU
IC205 SN7407
XF201 3.58M
IC207 uPC393
CP201
BRAKE SOLENOID
HEAD SOLENOID
REEL MOTOR CONTROL
CASSETTE S.W
REEL PULSE
SHUT OFF
DEPEND ON TAPE SPEED テープスピードにより変化する
300mS
5mS
20μS
CPU IC208 M88851
XF202 3.58M
IC209 SN7407
IC205, 209 SN7407 ⑭ 5V ⑦ GND
[CPU·POWER]
TO AUDIO BOARD CNP 3
TO AUDIO BOARD CNP 4 (WHT) CNP5 (RED)
[DIGITAL CONNECTOR]
Q851~Q855 DTA114ES
LINE/CONTROL OUTPUT
AC INLET

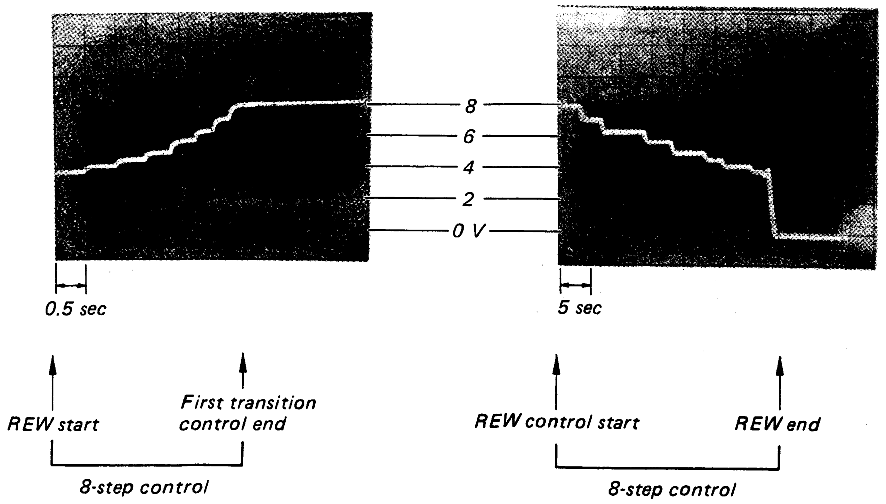
2-3. REEL MOTOR VOLTAGE CONTROL (in REW mode)

To shorten rewind time, a reel motor voltage is raised gradually from start of rewinding operation, however, to absorb a shock at the completion of rewinding, the voltage is controlled so that T-side disk rotation does not exceed 900 rpm.
This control is made by grounding R405, R406, and R407 at CPU.

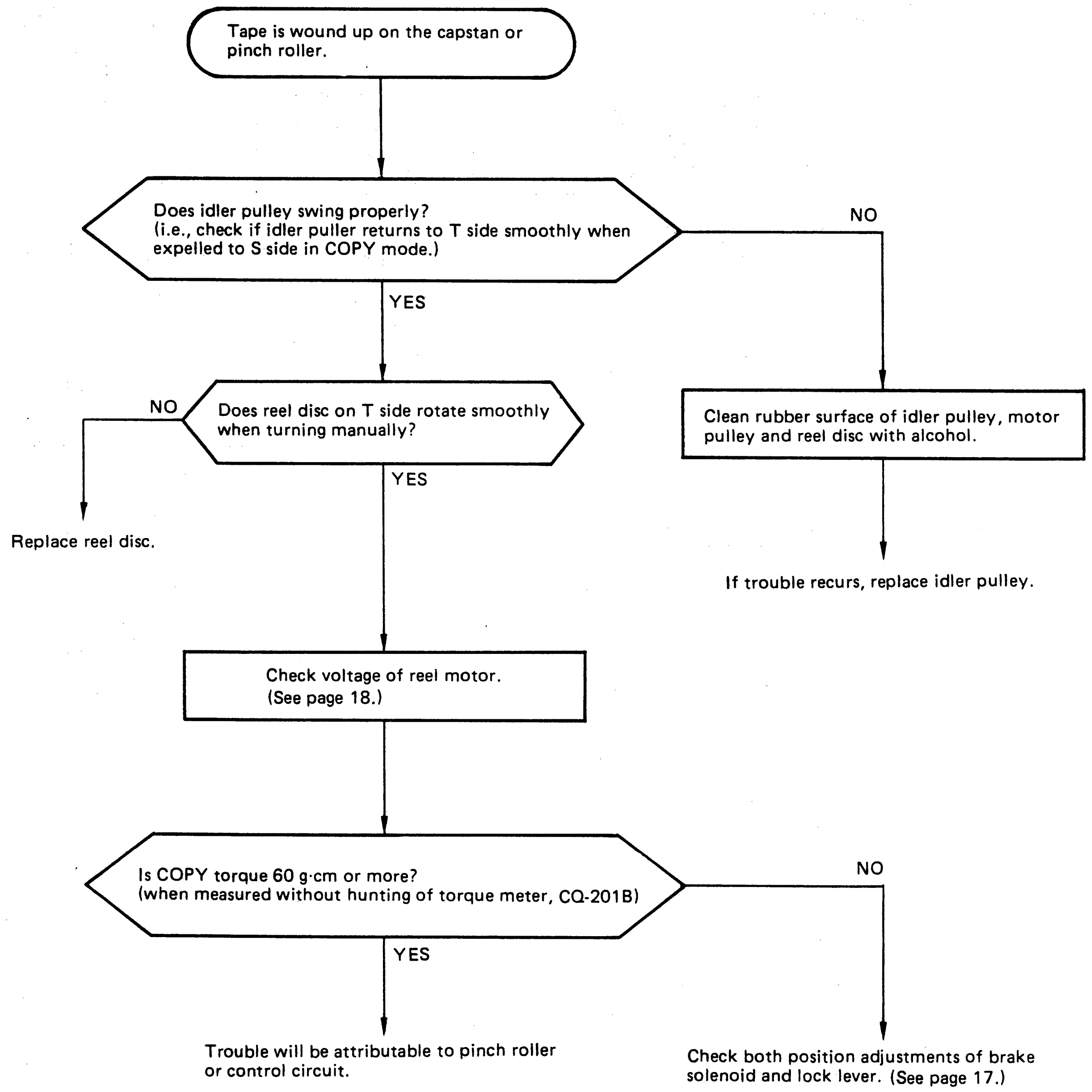

+B
to MOTOR
D406
R405
R406
R407
R408
C401
R409
to CPU

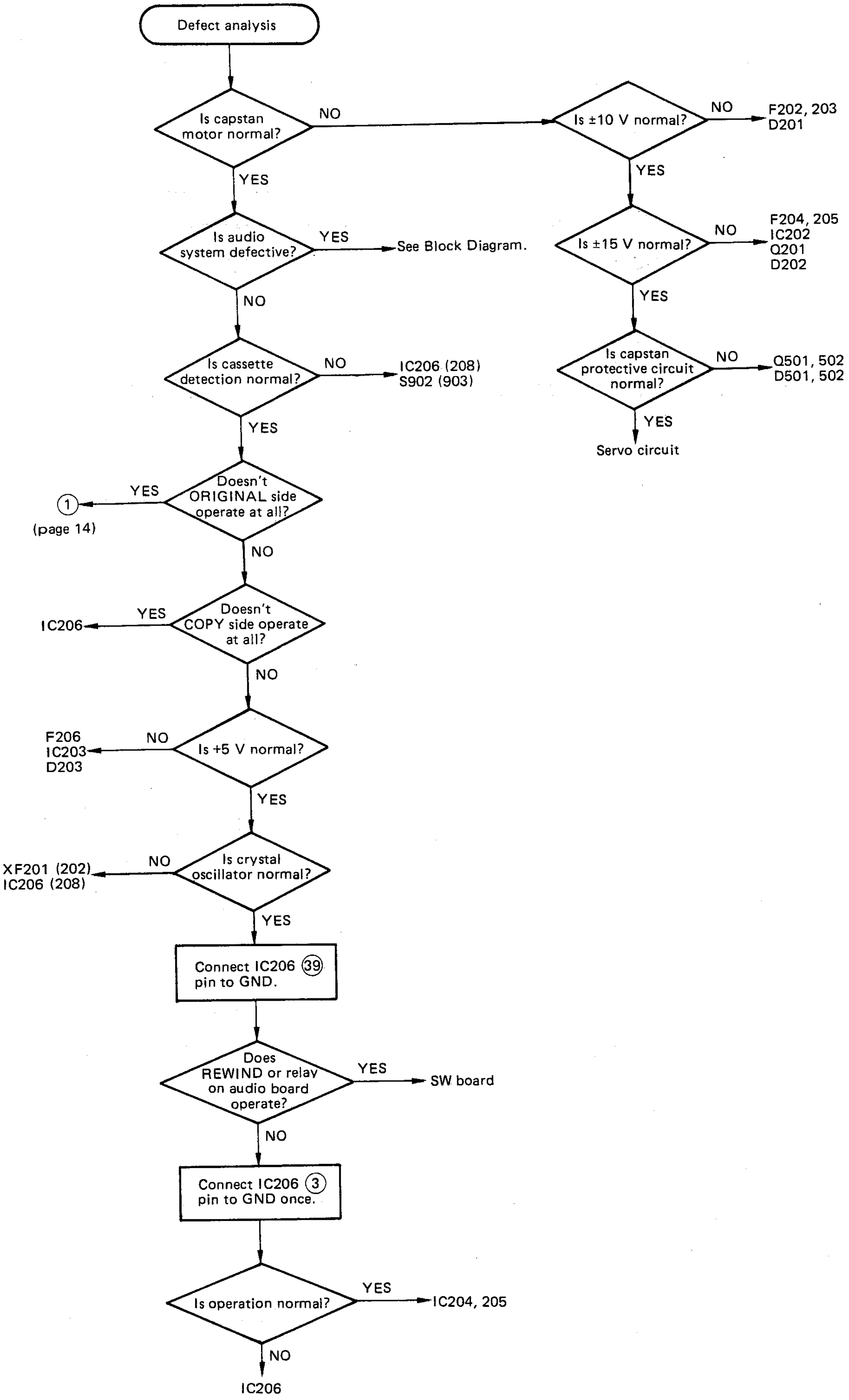
C401 and R409 are inserted to smooth a voltage change to prevent a tape from slackening.

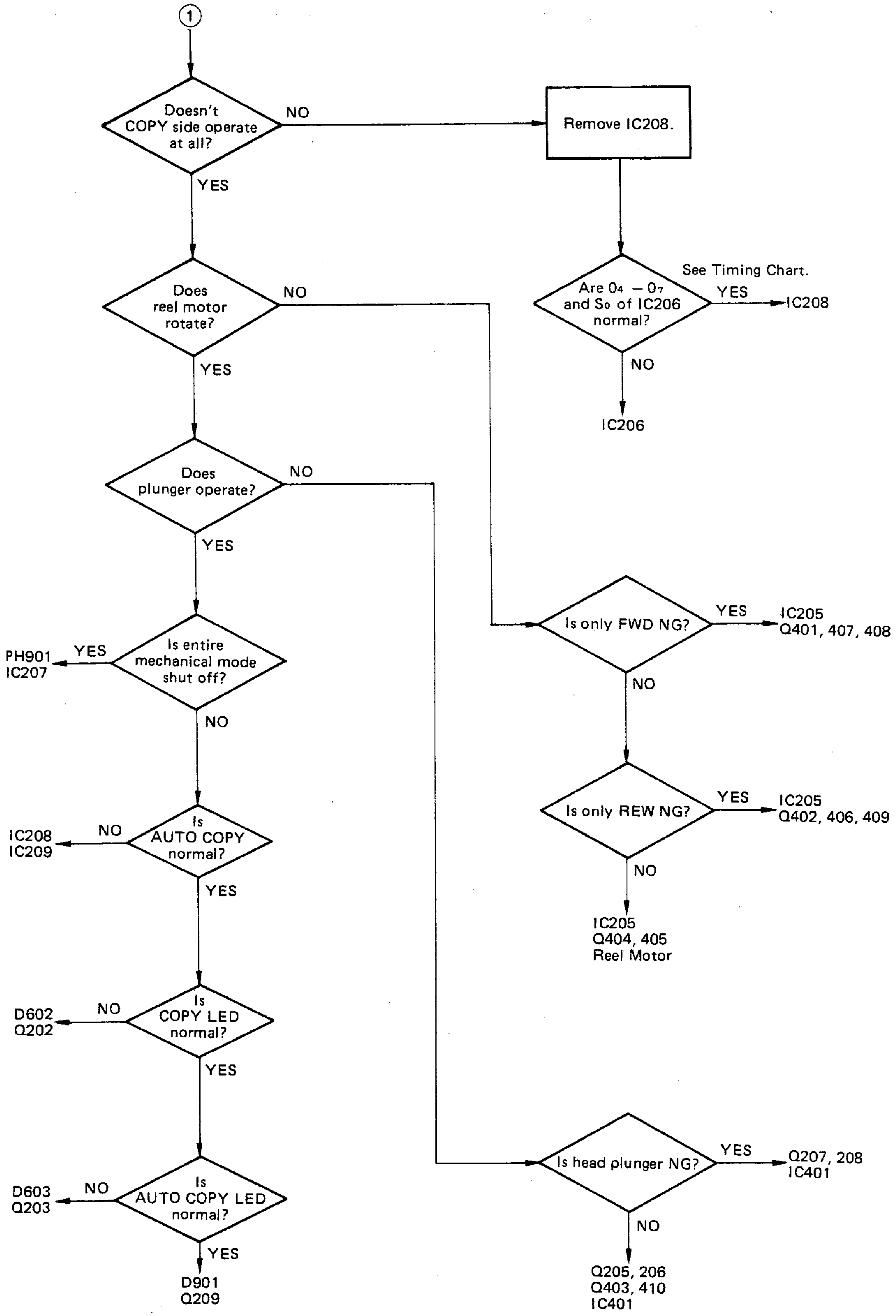
Waveform of reel motor voltage



SECTION 3
TROUBLE SHOOTING

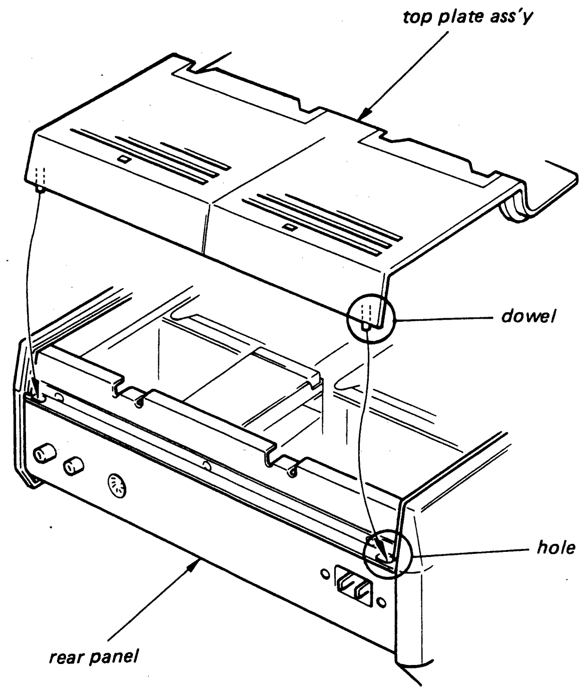

Tape is wound up on the capstan or pinch roller.
Does idler pulley swing properly? (i.e., check if idler puller returns to T side smoothly when expelled to S side in COPY mode.)
NO
YES
Clean rubber surface of idler pulley, motor pulley and reel disc with alcohol.
If trouble recurs, replace idler pulley.
Does reel disc on T side rotate smoothly when turning manually?
NO
Replace reel disc.
YES
Check voltage of reel motor. (See page 18.)
Is COPY torque 60 g·cm or more? (when measured without hunting of torque meter, CQ-201B)
NO
Check both position adjustments of brake solenoid and lock lever. (See page 17.)
YES
Trouble will be attributable to pinch roller or control circuit.


Defect analysis
Is capstan motor normal?
NO
YES
Is ±10 V normal?
NO
F202, 203
D201
YES
Is ±15 V normal?
NO
F204, 205
IC202
Q201
D202
YES
Is capstan protective circuit normal?
NO
Q501, 502
D501, 502
YES
Servo circuit
Is audio system defective?
YES
See Block Diagram.
NO
Is cassette detection normal?
NO
IC206 (208)
S902 (903)
YES
Doesn't ORIGINAL side operate at all?
YES
①
(page 14)
NO
Doesn't COPY side operate at all?
YES
IC206
NO
Is +5 V normal?
NO
F206
IC203
D203
YES
Is crystal oscillator normal?
NO
XF201 (202)
IC206 (208)
YES
Connect IC206 ㊴ pin to GND.
Does REWIND or relay on audio board operate?
YES
SW board
NO
Connect IC206 ③ pin to GND once.
Is operation normal?
YES
IC204, 205
NO
IC206

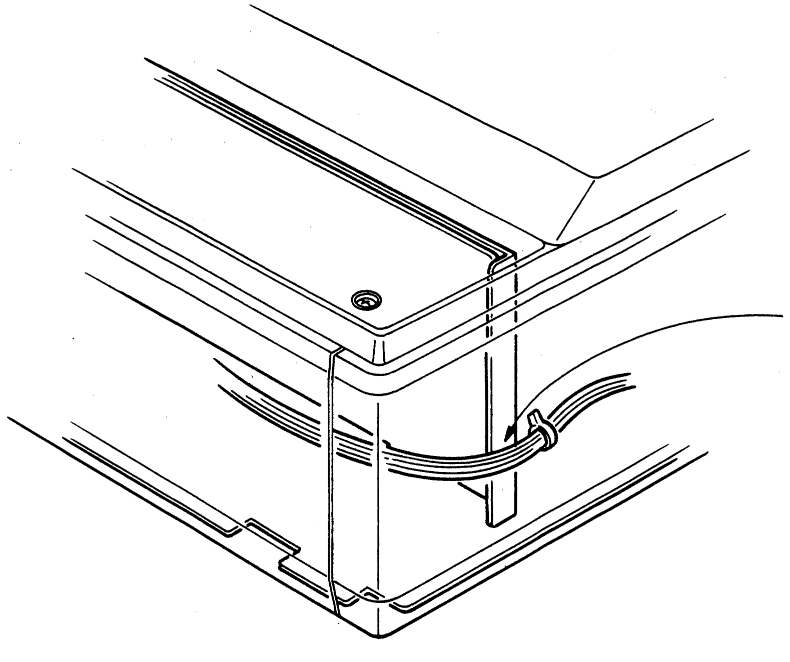

①
Doesn't COPY side operate at all?
NO
Remove IC208.
Are $O_4 - O_7$ and S_0 of IC206 normal?
See Timing Chart.
YES
IC208
NO
IC206
YES
Does reel motor rotate?
NO
Is only FWD NG?
YES
IC205
Q401, 407, 408
NO
Is only REW NG?
YES
IC205
Q402, 406, 409
NO
IC205
Q404, 405
Reel Motor
YES
Does plunger operate?
NO
Is head plunger NG?
YES
Q207, 208
IC401
NO
Q205, 206
Q403, 410
IC401
YES
Is entire mechanical mode shut off?
YES
PH901
IC207
NO
Is AUTO COPY normal?
NO
IC208
IC209
YES
Is COPY LED normal?
NO
D602
Q202
YES
Is AUTO COPY LED normal?
NO
D603
Q203
YES
D901
Q209

SECTION 4
ADJUSTMENT

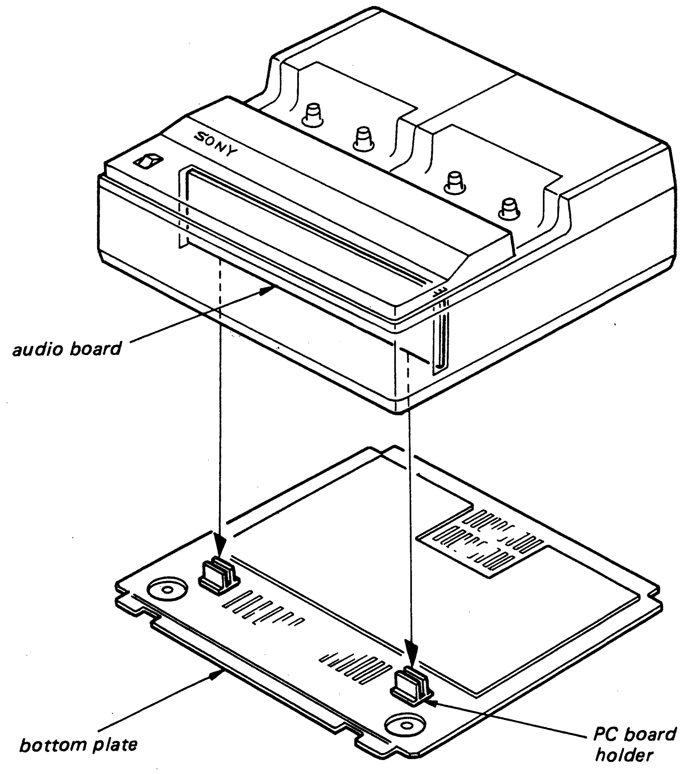
4-1. CAUTION


top plate ass'y
dowel
hole
rear panel

When mounting the top plate assembly, both dowels must be inserted into respective holes in the reinforcing plate on the rear panel.



Be sure to reassemble the cables on the side of the audio board when moving them to open the hinge attached to the CPU board.


audio board
bottom plate
PC board holder

The audio board must be caught by PC board holder when attaching the bottom plate.

4-2. TEST TAPE

Type	Part No.	Signal	
		Frequnecy (Hz)	Level (dB)
P-4-L300	7-819-011-11	315	0
P-4-A063	7-819-014-11	6.3 k	−10
P-4-A100	7-819-016-11	10 k	−10
WS-48A	7-819-032-11	3 k	0
CQ-012C	8-909-708-02	Mirror, 12μ base	
CQ-201B	8-909-708-41	Torque	

4-3. CASSETTE DETECTING SWITCH AND ITS OPERATION

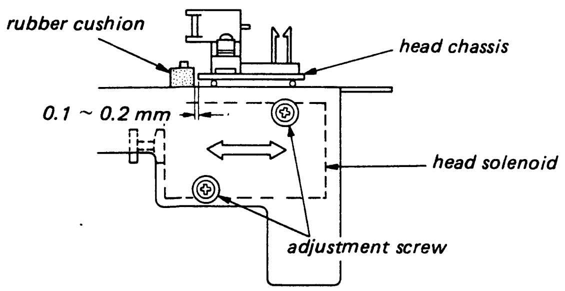
Each deck incorporates the cassette detecting switch and it never operate unless the switch is actuated. To operate the deck without loading a cassette, actuate the cassette detecting switch by taping it with an adhesive tape. (Note that in COPY and AUTO COPY modes, the COPY unit does not operate without actuating the cassette detecting switch on the ORIGINAL unit.)

4-4. MECHANICAL ADJUSTMENT

Head Solenoid Position Adjustment

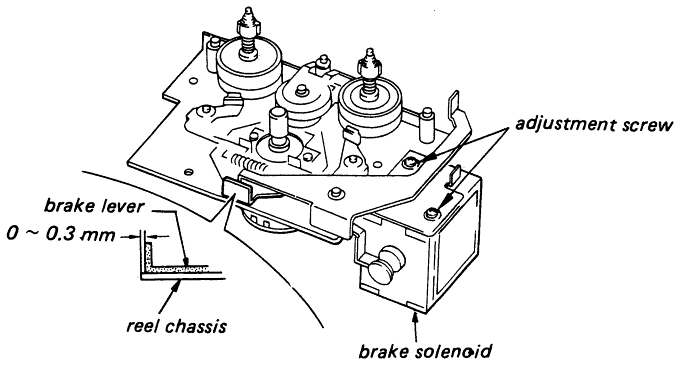
Mode: COPY

Adjust the head solenoid position so that the head chassis comes in position relative to the rubber cushion as shown in the figure.


rubber cushion
head chassis
0.1 ~ 0.2 mm
head solenoid
adjustment screw

Brake Solenoid Position Adjustment

1. Make the brake solenoid operated (by manually pushing in the plunger as far as it will go).
2. Adjust the brake solenoid position so that the brake lever comes in position relative to the reel chassis as shown in the figure.


adjustment screw
brake lever
0 ~ 0.3 mm
reel chassis
brake solenoid

Lock Lever Position Adjustment

Mode: COPY

1. Make the brake solenoid operated (by manually pushing in the plunger as far as it will go).
2. Adjust the lock lever position so that a clearance between lock lever and brake lever is made as shown in the Fig. 1.

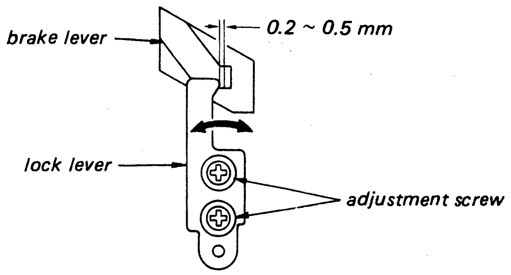

brake lever
0.2 ~ 0.5 mm
lock lever
adjustment screw

Fig. 1

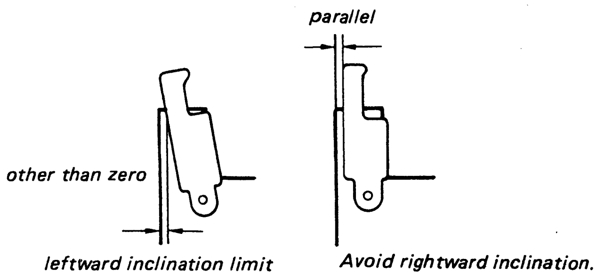

parallel
other than zero
leftward inclination limit
Avoid rightward inclination.

Fig. 2

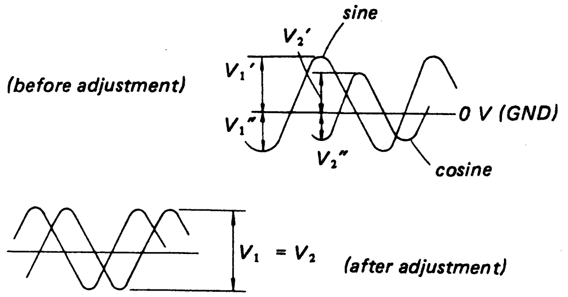
Note:
Adjust the lock lever within the range shown in Fig. 2. Unless adjustable within the range, readjust the brake solenoid position.

Capstan Motor Adjustment (Offset, Balance)

Setting:
Output ..... CN502 PIN 1, 9
Mode ...... STOP

Procedure:

1. Adjust the position control of the oscilloscope to center the trace over the center graticule line for two inputs.
2. Adjust RV503 and RV504 so that V1' is equal to V1'' and V2' is equal to V2'' on the oscilloscope (Offset Adjustment).
3. Adjust RV502 so that V1 is equal to V2 on the oscilloscope (Balance Adjustment).



Capstan Motor Adjustment (Speed)

Setting:
Output TP2

Procedure:

1. Execute playback (COPY mode) of the test tape (WS-48A).
2. Adjust RV501 so that the following specification is fulfilled in the middle of the tape.

Specification:
24 kHz ±0.5% (ORIGINAL)
23.76 kHz ±0.5% (COPY)

Note:

1. Adjust the capstan motor of the COPY unit by utilizing the playback-amplifier of the ORIGINAL unit after exchanging decks each other.
2. To exchange each deck, exchange two connectors coming from the CPU board and also exchange head terminal by soldering.
3. As shown in the specification above, a speed difference is given between ORIGINAL unit and COPY unit (1%) so as to avoid omission of recording due to variation in tape length.
4. Both offset and balance should be adjusted before this adjustment.
5. When the head azimuth adjustemnt is needed in the COPY unit, perform the adjustment during this time that the decks are exchanged.

Reel Motor Adjustment

Setting:
Output ..... Mech drive board, termianl
7, 6 (GND): COPY
6, 7 (GND): REW

Procedure:

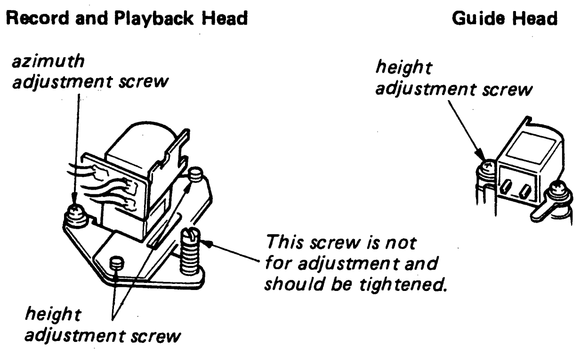
1. Activate the RECORD mode without loading a tape.
2. Adjust RV401 so that the output becomes 3.5 V.
3. Activate the REWIND mode without loading a tape.
4. Adjust RV402 so that the output becomes 8 V.

Note:

1. Keep the reel disc on T side turning manually in REWIND mode.
2. In such a case, turn it slowly (lowest turning speed that the deck does not turn into STOP mode: 2 to 3 sec per turn).
3. A reel motor voltage changes according to the turning speed of reel disc on the T side (see circuit description on page 13). In this case, make adjustment so that the specified value can be obtained at the lowest speed of reel disc.
4. Be sure to exchange + and – of the measuring instrument in COPY and REWIND modes each other.

Head Height Adjustment

Install a mirror tape cassette (CQ-012C). Pressing repeatedly COPY button and STOP button alternately, adjust the respective adjustment parts shown below so that the tape can properly be held by the tape guide.


Record and Playback Head
Guide Head
azimuth adjustment screw
height adjustment screw
This screw is not for adjustment and should be tightened.
height adjustment screw

Note:
Also pay attention to head verticality and flapping, and execute visual confirmation.
For this, turn the front and back height adjustment screws and the vertical adjustment screw each for about the same amount.

Head Azimuth Adjustment

Setting:

Output TP14

Procedure :

1. Execute playback (COPY mode) of the test tape (P-4-A100).
2. Adjust the screw so that the output becomes a maximum.

Note:

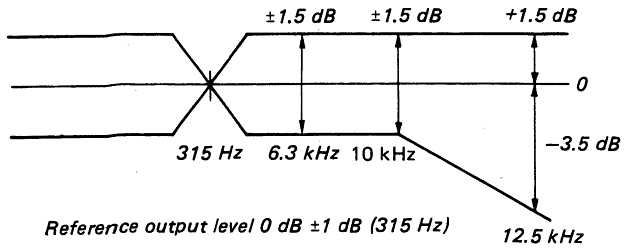
1. As peaks also occur before and after the correct vertical condition, adjust to the maximum peak.
2. For the record head (COPY unit), make above adjustment after exchanging the deck with that of ORIGINAL unit. (See Capstan Motor Adjustment.)

4-5. ELECTRICAL ADJUSTMENT

Playback Level and Frequency Response Adjustment

	Setting (output)	Procedure (playback the test tape and adjust RV)		
		315 Hz	6.3 kHz	10 kHz
track 1	TP2	RV2	RV13	RV1
track 2	TP5	RV5	RV14	RV4
track 3	TP8	RV8	RV15	RV7
track 4	TP11	RV11	RV16	RV10
Test tape		P-4-L300	P-4-A063	P-4-A100

Specification:



Reference output level 0 dB ±1 dB (315 Hz)

Bias Trap Adjustment

Setting:

Output	track 1	TP3	track 3	TP9
	track 2	TP6	track 4	TP12
Mode	COPY			
CHANNEL SW	A + B			

Procedure:

Adjust CP1 – 4 so that the output becomes a minimum.

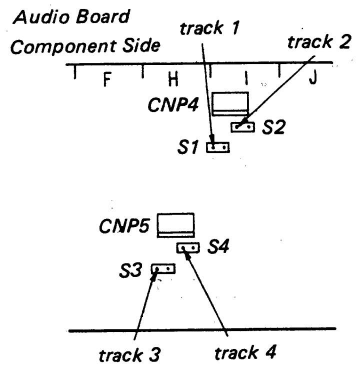
track 1	CP1	track 3	CP3
track 2	CP2	track 4	CP4

Bias Adjustment

Setting:

Cut off a signal transmitted from the playback head by disconnecting S1 to S4;

Input ..... S1 to S4 (left side pin)
2.5 kHz and 80 kHz, –20 dB.
CHANNEL SW .... A + B



Procedure:

1. Record above signal on a blank tape.
2. Playback the recorded portion with a standard playback unit.
3. Adjust CT so that the 10 kHz output level is $^{+2}_{-0}$ dB per 315 kHz output level.

track 1	CT1	track 3	CT3
track 2	CT2	track 4	CT4

Note:

1. A stereo cassette recorder of which playback head azimuth is correctly adjusted may be used as a standard playback unit.
2. Obtain a measurement value after calibrating the output.
3. The bias frequency should be adjusted before this adjustment.
4. Turning CT counterclockwise raises the 10 kHz output level.
5. Be careful not to allow contact of a screwdriver with the chassis, or use a plastic screwdriver.

Record Level Adjustment

Setting:

CHANNEL SW .... A + B

Procedure:

1. Duplicate the test tape P-4-L300 on a blank tape.
2. Playback the recorded portion with a standard playback unit.
3. Unless an output falls within the specification, make adjustment by turning RV.

track 1	RV3	track 3	RV9
track 2	RV6	track 4	RV12

Specification:

0 dB ±2 dB

Note:

1. Turning RV clockwise raises the output level.
2. The playback level should be adjusted before this adjustment.

Bias Frequency Adjustment

Setting:

Output .... Record Head Terminal
Mode .... COPY
CHANNEL SW .... A + B

Procedure:

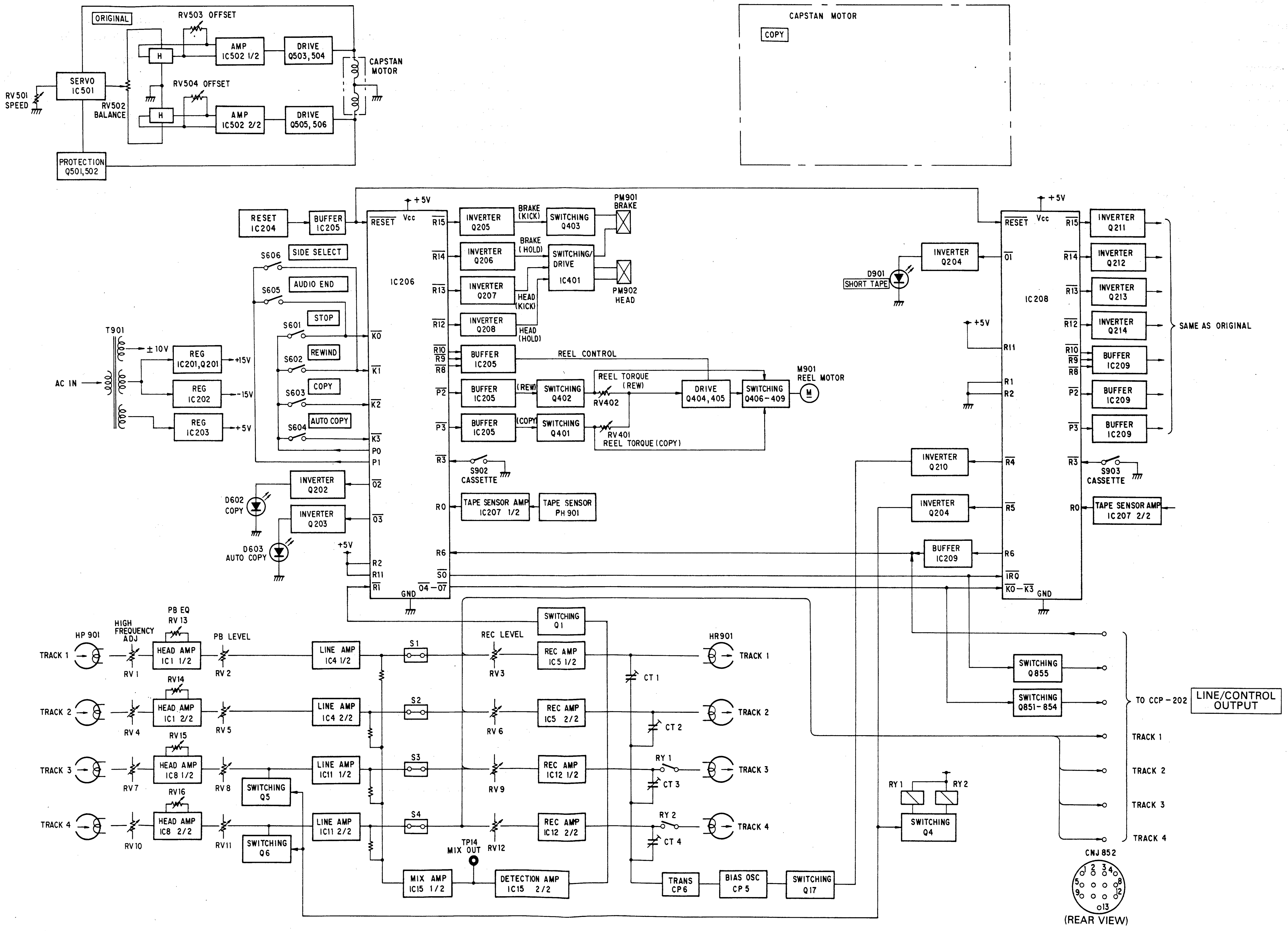
Adjust CP5 so that the frequency becomes 600 kHz.

Specification:

600 kHz ±5%

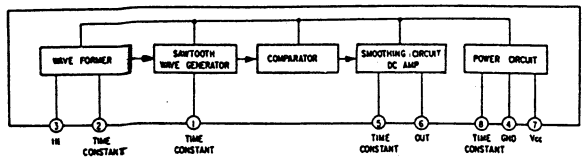
SECTION 5
DIAGRAMS

5-1. BLOCK DIAGRAMS

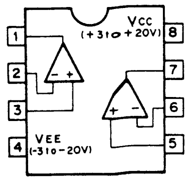

ORIGINAL
RV503 OFFSET
RV504 OFFSET
H
AMP IC502 1/2
AMP IC502 2/2
DRIVE Q503, 504
DRIVE Q505, 506
CAPSTAN MOTOR
SERVO IC501
RV501 SPEED
RV502 BALANCE
PROTECTION Q501,502
CAPSTAN MOTOR
COPY
RESET IC204
BUFFER IC205
+5V
RESET
Vcc
IC206
SIDE SELECT
S606
AUDIO END
S605
STOP
S601
REWIND
S602
COPY
S603
AUTO COPY
S604
K0
K1
K2
K3
P0
P1
O2
O3
R2
R11
R1
GND
T901
AC IN
±10V
REG IC201,Q201
+15V
REG IC202
-15V
REG IC203
+5V
INVERTER Q202
D602 COPY
INVERTER Q203
D603 AUTO COPY
+5V
R15
R14
R13
R12
R10
R9
R8
P2
P3
R3
R0
R6
S0
O4-O7
INVERTER Q205
BRAKE (KICK)
SWITCHING Q403
PM901 BRAKE
INVERTER Q206
BRAKE (HOLD)
SWITCHING/DRIVE IC401
PM902 HEAD
INVERTER Q207
HEAD (KICK)
INVERTER Q208
HEAD (HOLD)
BUFFER IC205
REEL CONTROL
BUFFER IC205
(REW)
SWITCHING Q402
REEL TORQUE (REW)
RV402
DRIVE Q404, 405
SWITCHING Q406-409
M901 REEL MOTOR
M
BUFFER IC205
(COPY)
SWITCHING Q401
RV401 REEL TORQUE (COPY)
S902 CASSETTE
TAPE SENSOR AMP IC207 1/2
TAPE SENSOR PH901
+5V
RESET
Vcc
IC208
INVERTER Q204
O1
D901 SHORT TAPE
+5V
R11
R1
R2
R4
R5
R6
IRQ
K0-K3
GND
INVERTER Q210
INVERTER Q204
BUFFER IC209
R15
R14
R13
R12
R10
R9
R8
P2
P3
R3
R0
INVERTER Q211
INVERTER Q212
INVERTER Q213
INVERTER Q214
BUFFER IC209
BUFFER IC209
BUFFER IC209
SAME AS ORIGINAL
S903 CASSETTE
TAPE SENSOR AMP IC207 2/2
HP901
TRACK 1
TRACK 2
TRACK 3
TRACK 4
HIGH FREQUENCY ADJ
PB EQ RV13
RV14
RV15
RV16
RV1
RV4
RV7
RV10
HEAD AMP IC1 1/2
HEAD AMP IC1 2/2
HEAD AMP IC8 1/2
HEAD AMP IC8 2/2
PB LEVEL
RV2
RV5
RV8
RV11
SWITCHING Q5
SWITCHING Q6
LINE AMP IC4 1/2
LINE AMP IC4 2/2
LINE AMP IC11 1/2
LINE AMP IC11 2/2
S1
S2
S3
S4
SWITCHING Q1
REC LEVEL
RV3
RV6
RV9
RV12
REC AMP IC5 1/2
REC AMP IC5 2/2
REC AMP IC12 1/2
REC AMP IC12 2/2
TP14 MIX OUT
MIX AMP IC15 1/2
DETECTION AMP IC15 2/2
CT1
CT2
CT3
CT4
RY1
RY2
HR901
TRACK 1
TRACK 2
TRACK 3
TRACK 4
TRANS CP6
BIAS OSC CP5
SWITCHING Q17
RY1
RY2
SWITCHING Q4
SWITCHING Q855
SWITCHING Q851-854
TO CCP-202
LINE/CONTROL OUTPUT
TRACK 1
TRACK 2
TRACK 3
TRACK 4
CNJ852
1 2 3 4 5 6 7 8 9 10 11 12 13
(REAR VIEW)

5-2. SEMICONDUCTORS

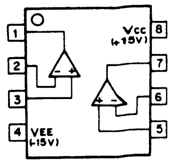
CX065B (MITSUBISHI)
SERVO AMPLIFIER


WAVE FORMER
SAWTOOTH WAVE GENERATOR
COMPARATOR
SMOOTHING CIRCUIT DC AMP
POWER CIRCUIT
③ IN
② TIME CONSTANT
① TIME CONSTANT
⑤ TIME CONSTANT
⑥ OUT
⑧ TIME CONSTANT
④ GND
⑦ Vcc

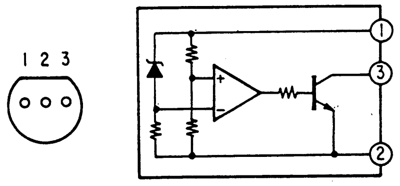
NE5532P (TI)
LOW NOISE OPERATIONAL AMPLIFIER
— TOP VIEW —


Vcc (+3 to +20V)
VEE (-3 to -20V)
1
2
3
4
5
6
7
8

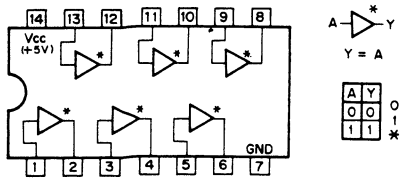
NJM2043D-D (JRC)
OPERATIONAL AMPLIFIER
— TOP VIEW —


Vcc (+15V)
VEE (-15V)
1
2
3
4
5
6
7
8

PST520 (MITSUMI)
4.5V SYSTEM RESET IC
– BOTTOM VIEW –



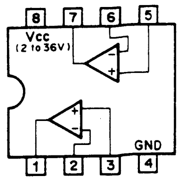
SN7407N (TI)
TTL BUFFER/DRIVER WITH OPEN-COLLECTOR
— TOP VIEW —


Vcc (+5V)
GND
14 13 12 11 10 9 8
1 2 3 4 5 6 7
A
Y
Y = A

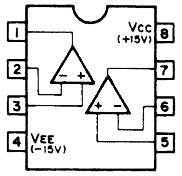
A	Y
0	0
1	1

0 ; LOW LEVEL
1 ; HIGH LEVEL
✱ ; OPEN COLLECTOR

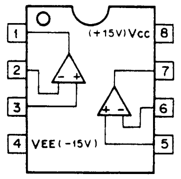
uPC393C (NEC)
VOLTAGE COMPARATOR
— TOP VIEW —


Vcc (2 to 36V)
GND
8 7 6 5
1 2 3 4

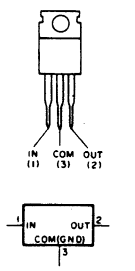
uPC4556C (NEC)
OPERATIONAL AMPLIFIER
(WIDE BAND, DECOMPENSATED)
— TOP VIEW —


Vcc (+15V)
VEE (-15V)
1
2
3
4
5
6
7
8

uPC4558C (NEC)
OPERATIONAL AMPLIFIER
— TOP VIEW —

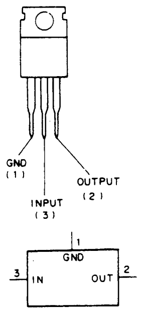

(+15V) Vcc
VEE (-15V)
1
2
3
4
5
6
7
8

μPC7805H (NEC)
μPC7815H (NEC)
POSITIVE VOLTAGE REGULATOR (1A)
— SIDE VIEW —


IN (1)
COM (3)
OUT (2)
1 IN
OUT 2
COM(GND)
3

OUTPUT VOLTAGE	
5V	05
6V	06
8V	08
9V	09
12V	12
15V	15
18V	18
20V	20
24V	24

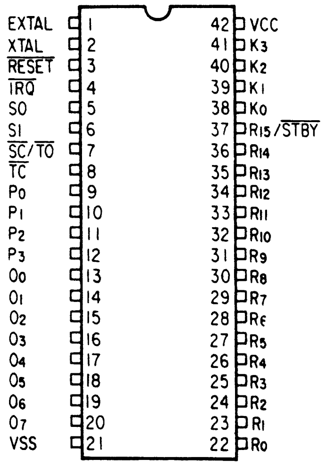
μPC7915H (NEC)
NEGATIVE VOLTAGE REGULATOR (1A)

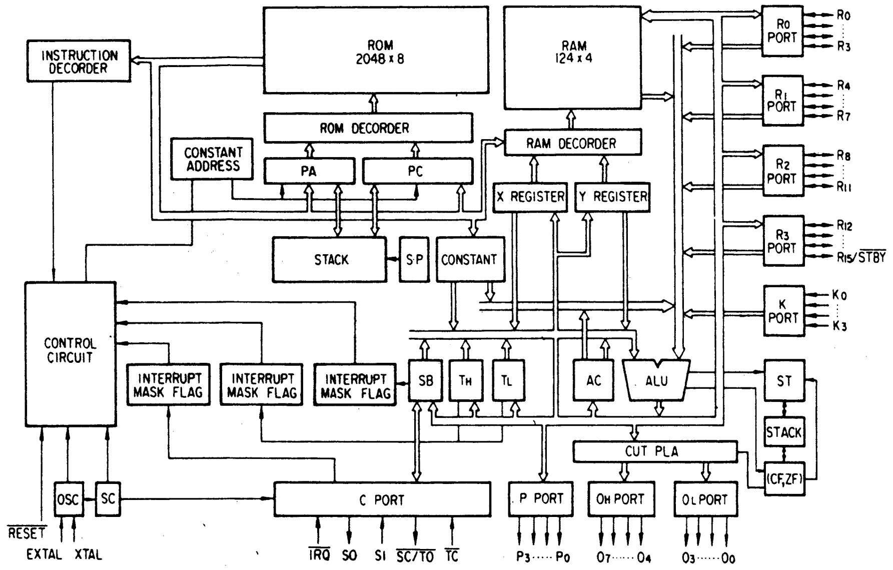

GND (1)
OUTPUT (2)
INPUT (3)
1
GND
3 IN
OUT 2

− 5V	μA7905UC	FS7905	μPC7905H
− 6V	μA7906UC		
− 8V	μA7908UC		μPC7908H
−12V	μA7912UC		μPC7912H
−15V	μA7915UC		μPC7915H
−18V	μA7918UC		μPC7918H
−24V	μA7924UC		μPC7924H

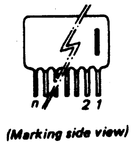
MB8851 (FUJITSU)
1 CHIP 4 BIT MICROCOMPUTER

TOP VIEW

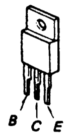

EXTAL 1
XTAL 2
RESET 3
IRQ 4
SO 5
SI 6
SC/TO 7
TC 8
P0 9
P1 10
P2 11
P3 12
O0 13
O1 14
O2 15
O3 16
O4 17
O5 18
O6 19
O7 20
VSS 21
42 VCC
41 K3
40 K2
39 K1
38 K0
37 R15/STBY
36 R14
35 R13
34 R12
33 R11
32 R10
31 R9
30 R8
29 R7
28 R6
27 R5
26 R4
25 R3
24 R2
23 R1
22 R0


INSTRUCTION DECORDER
ROM 2048 x 8
RAM 124 x 4
ROM DECORDER
RAM DECORDER
CONSTANT ADDRESS
PA
PC
X REGISTER
Y REGISTER
STACK
S·P
CONSTANT
CONTROL CIRCUIT
INTERRUPT MASK FLAG
INTERRUPT MASK FLAG
INTERRUPT MASK FLAG
SB
TH
TL
AC
ALU
ST
STACK
(CF,ZF)
CUT PLA
OSC
SC
C PORT
P PORT
OH PORT
OL PORT
R0 PORT
R1 PORT
R2 PORT
R3 PORT
K PORT
R0 … R3
R4 … R7
R8 … R11
R12 … R15/STBY
K0 … K3
RESET
EXTAL XTAL
IRQ SO SI SC/TO TC
P3 …… P0
O7 …… O4
O3 …… O0

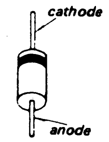
BX1211


n
2 1
(Marking side view)

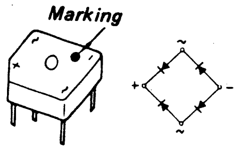
2SB834
2SD880



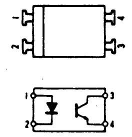
1S1555
1SS106


cathode
anode

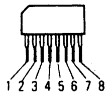
S2VB20



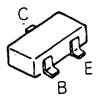
TLP521-1



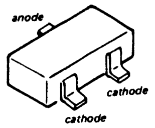
CX065B



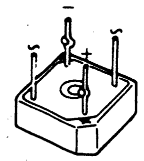
2SC1623-L7
DTA124XK



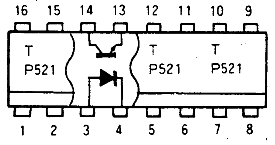
1S2835


anode
cathode
cathode

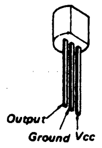
S5VB20



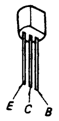
TLP521-4


16 15 14 13 12 11 10 9
T P521
T P521
T P521
1 2 3 4 5 6 7 8

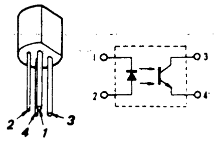
PST520


Output
Ground
Vcc

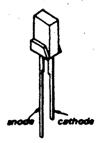
2SC3070



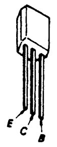
NJL5141E



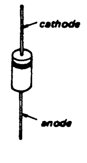
SEL1121R
SEL1321G


anode
cathode

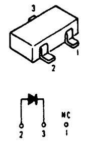
2SB808
2SC2603
2SD1012
DTA114ES
DTA124ES
DTC114ES



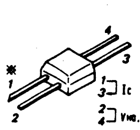
10E2


cathode
anode

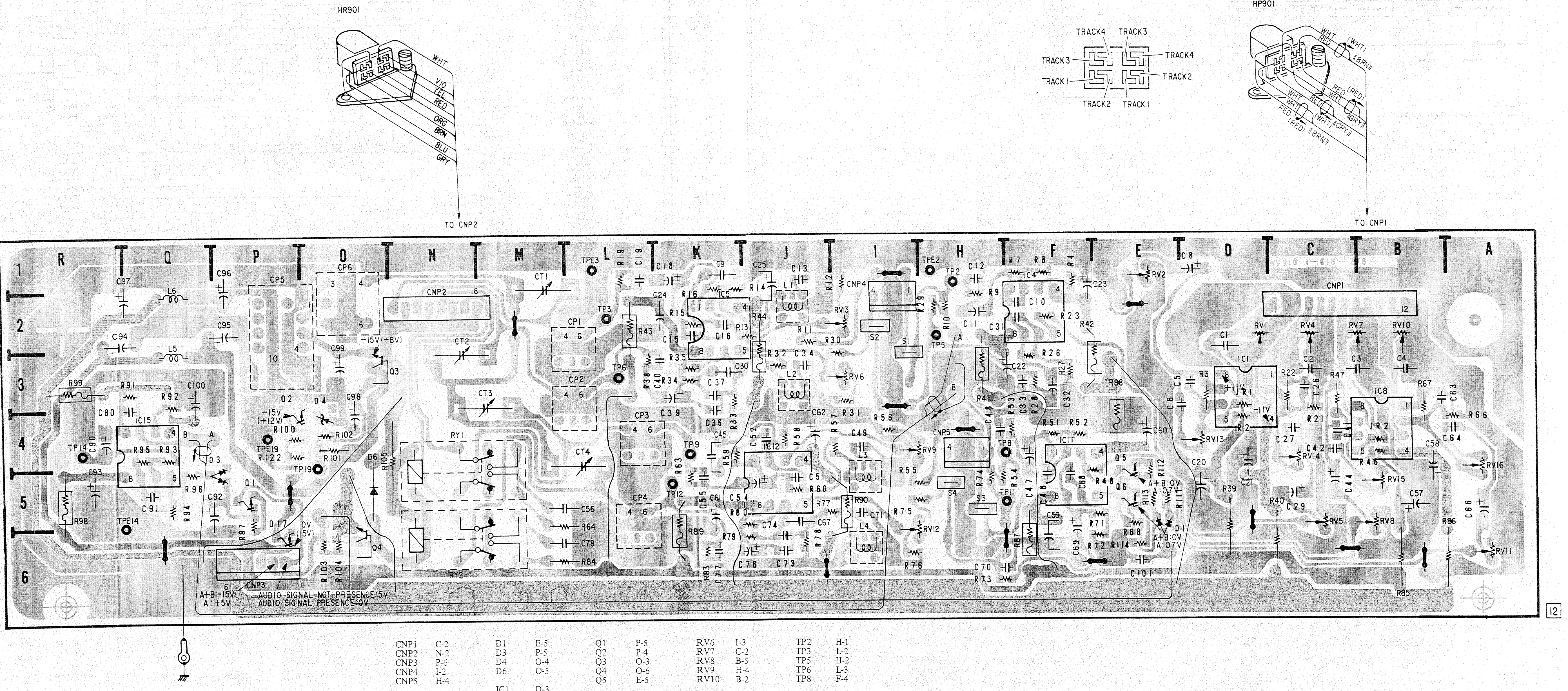
RD24M-B1



THS102A


✱
1
2
3
4
1 3 Ic
2 4 VHO,VH

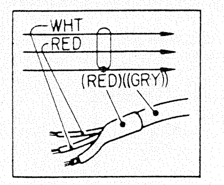
5-3. AUDIO BOARD *– Soldering Side –*


HR901
WHT
VIO
YEL
RED
ORG
BRN
BLU
GRY
TO CNP2
TRACK4
TRACK3
TRACK3
TRACK4
TRACK1
TRACK2
TRACK2
TRACK1
HP901
WHT (WHT)
RED (BRN)
RED (RED)
WHT (WHT)((GRY))
RED (BRN)
TO CNP1
R Q P O N M L K J I H F E D C B A
1 2 3 4 5 6
CNP1
CNP2
CNP3
CNP4
CNP5
-15V(+8V)
-15V (+12V)
0V (-15V)
A+B:-15V
A:+5V
AUDIO SIGNAL NOT PRESENCE:5V
AUDIO SIGNAL PRESENCE:0V
A+B:0V
A:0.7V
+11V
-11V
12

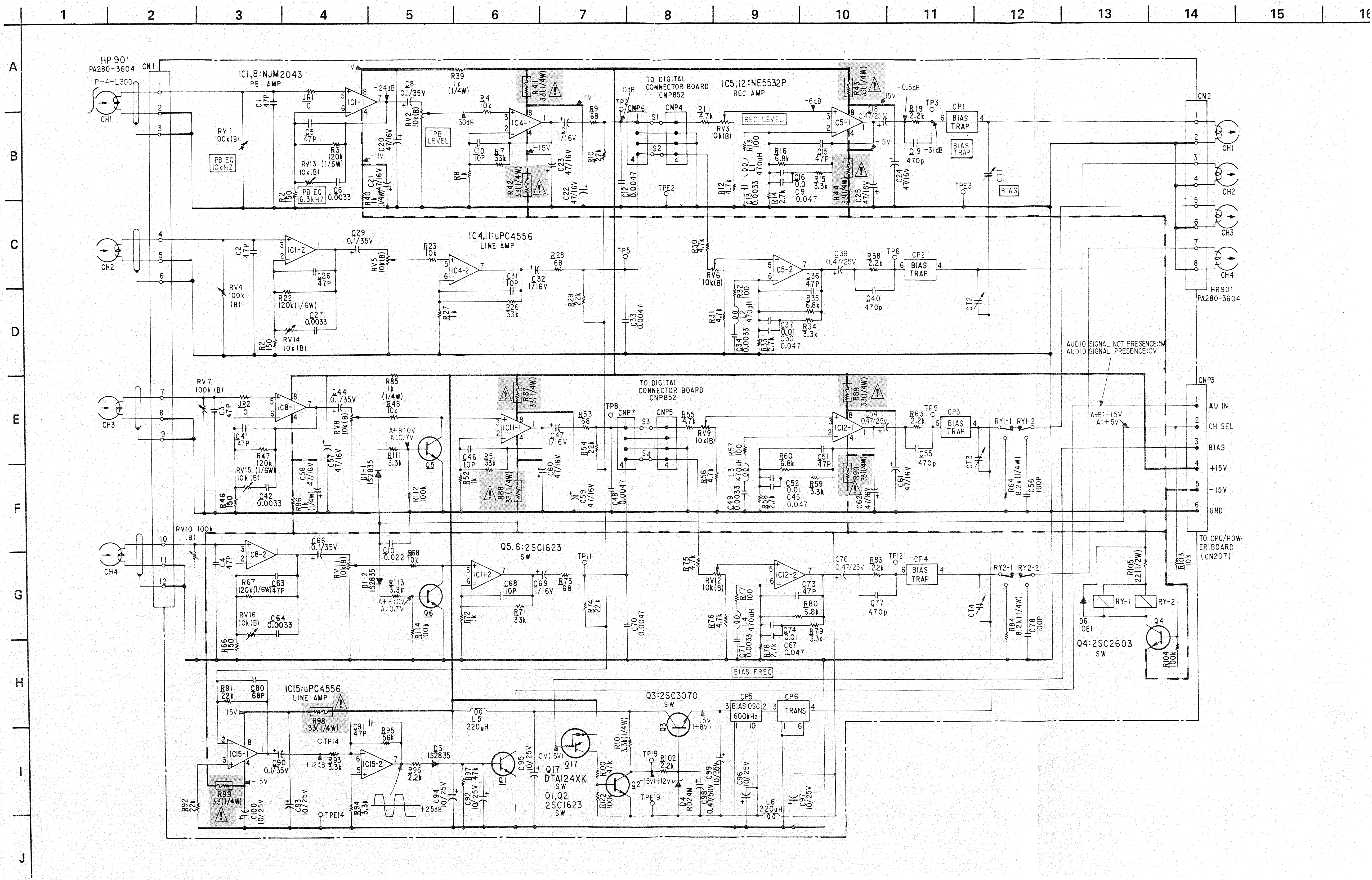
CNP1	C-2
CNP2	N-2
CNP3	P-6
CNP4	I-2
CNP5	H-4
CP1	L-3
CP2	L-4
CP3	L-4
CP4	L-6
CP5	P-2
CT1	M-1
CT2	N-3
CT3	M-4
CT4	L-5
D1	E-5
D3	P-5
D4	O-4
D6	O-5
IC1	D-3
IC4	F-2
IC5	K-2
IC8	B-4
IC11	F-5
IC12	J-5
IC15	Q-4
Q1	P-5
Q2	P-4
Q3	O-3
Q4	O-6
Q5	E-5
Q6	E-5
Q17	P-6
RV1	D-2
RV2	E-1
RV3	I-2
RV4	C-2
RV5	C-5
RV6	I-3
RV7	C-2
RV8	B-5
RV9	H-4
RV10	B-2
RV11	A-6
RV12	H-5
RV13	D-4
RV14	C-4
RV15	B-5
RV16	A-5
TP2	H-1
TP3	L-2
TP5	H-2
TP6	L-3
TP8	F-4
TP9	K-4
TP11	F-5
TP12	K-5
TP14	R-4
TP19	O-5
TPE2	H-1
TPE3	L-1
TPE14	Q-6
TPE19	P-4

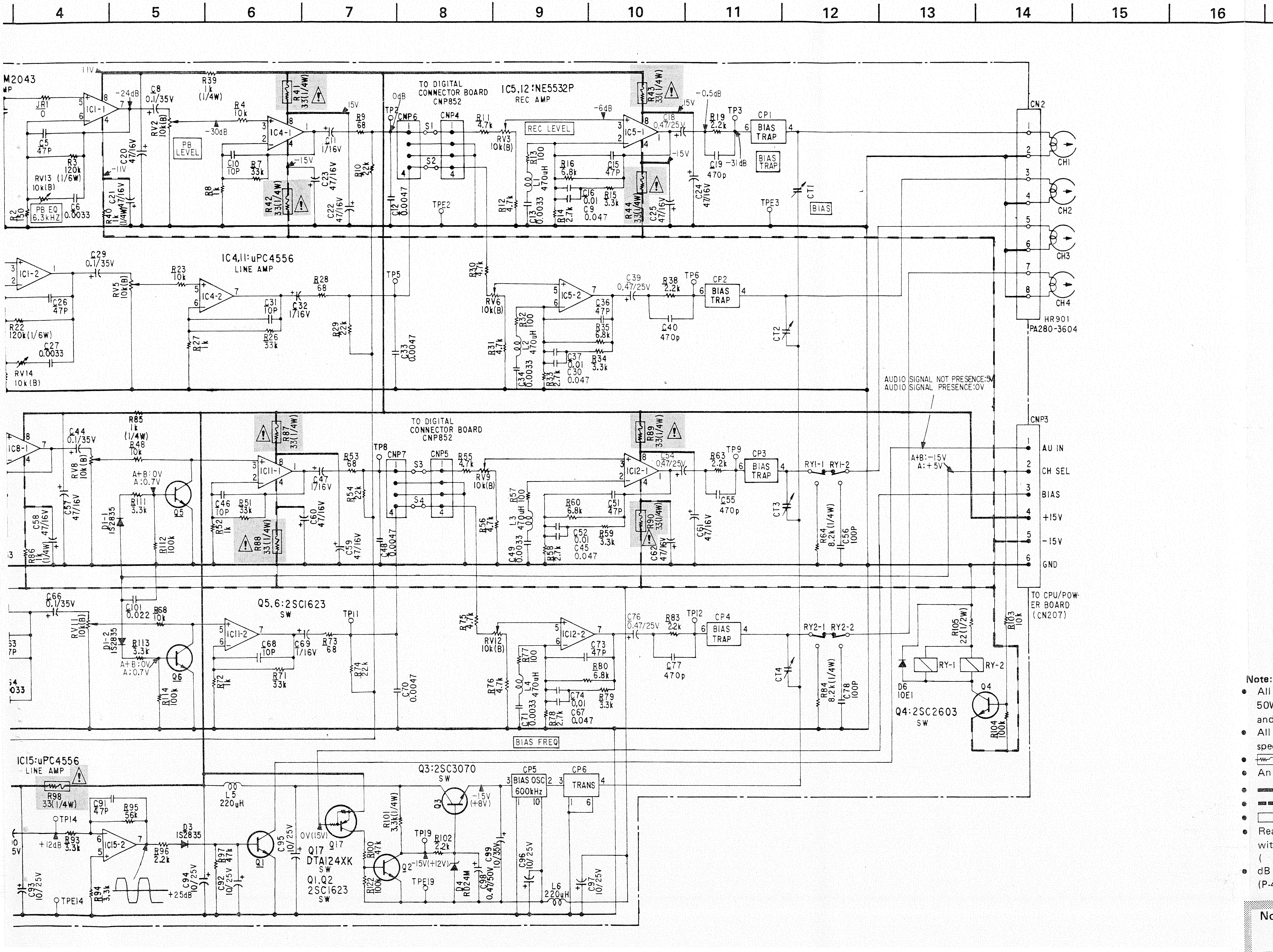
Note:

- Color code or sleeving over the end of the jacket.


WHT
RED
(RED)((GRY))

- ▒ : B+ pattern.
- ▒ : B− pattern.


HP901
PA280-3604
P-4-L300
CN1
CH1
CH2
CH3
CH4
IC1,8:NJM2043
PB AMP
IC1-1
IC1-2
IC8-1
IC8-2
PB EQ 10kHZ
PB EQ 6.3kHZ
PB LEVEL
IC4,11:uPC4556
LINE AMP
IC4-1
IC4-2
IC11-1
IC11-2
TO DIGITAL CONNECTOR BOARD CNP852
IC5,12:NE5532P
REC AMP
IC5-1
IC5-2
IC12-1
IC12-2
REC LEVEL
CNP4
CNP5
CNP6
CNP7
S1
S2
S3
S4
CP1 BIAS TRAP
CP2 BIAS TRAP
CP3 BIAS TRAP
CP4 BIAS TRAP
BIAS
BIAS TRAP
CT1
CT2
CT3
CT4
CN2
HR901
PA280-3604
CNP3
AU IN
CH SEL
BIAS
+15V
-15V
GND
TO CPU/POWER BOARD (CN207)
AUDIO SIGNAL NOT PRESENCE:5V
AUDIO SIGNAL PRESENCE:0V
A+B:-15V
A:+5V
RY1-1
RY1-2
RY2-1
RY2-2
RY-1
RY-2
D6 10E1
Q4:2SC2603
SW
R103 10k
R104 100k
R105 22(1/2W)
Q5,6:2SC1623
SW
Q5
Q6
D1-1 1S2835
D1-2 1S2835
A+B:0V
A:0.7V
BIAS FREQ
IC15:uPC4556
LINE AMP
IC15-1
IC15-2
R98 33(1/4W)
R99 33(1/4W)
Q3:2SC3070
SW
CP5 BIAS OSC 600kHz
CP6 TRANS
Q17 DTA124XK
SW
Q1,Q2 2SC1623
SW
Q1
Q2
Q17
D3 1S2835
D4 RD24M
L5 220uH
L6 220uH
TP1
TP2
TP3
TP5
TP6
TP8
TP9
TP11
TP12
TP14
TP19
TPE2
TPE3
TPE14
TPE19
11V
-24dB
-30dB
0dB
-6dB
-0.5dB
-31dB
15V
-15V
-11V
+12dB
+25dB
0V(15V)
-15V(+8V)
-15V(+12V)
R41 33(1/4W)
R42 33(1/4W)
R43 33(1/4W)
R44 33(1/4W)
R87 33(1/4W)
R88 33(1/4W)
R89 33(1/4W)
R90 33(1/4W)
R39 1k (1/4W)
R85 1k (1/4W)
R101 3.3k(1/4W)
R64 8.2k(1/4W)
R84 8.2k(1/4W)
RV1 100k(B)
RV2 10k(B)
RV3 10k(B)
RV4 100k (B)
RV5 10k(B)
RV6 10k(B)
RV7 100k (B)
RV8 10k(B)
RV9 10k(B)
RV10 100k (B)
RV11 10k(B)
RV12 10k(B)
RV13 10k(B)
RV14 10k (B)
RV15 10k (B)
RV16 10k (B)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
A B C D E F G H I J


4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
M2043
IC1-1
JR1 0
C5 47P
R3 120k
RV13 (1/6W) 10k(B)
PB EQ 6.3kHZ
C6 0.0033
R39 1k (1/4W)
R4 10k
-24dB
C8 0.1/35V
RV2 10k(B)
PB LEVEL
-30dB
C20 47/16V
C21 47/16V
R40 1k (1/4W)
IC4-1
R41 33(1/4W)
R42 33(1/4W)
R7 33k
R8 1k
C10 10P
C11 1/16V
C22 47/16V
C23 47/16V
R9 68
R10 22k
-15V
15V
TO DIGITAL CONNECTOR BOARD CNP852
IC5,12:NE5532P REC AMP
0dB
TP2
CNP6
CNP4
S1
S2
C12 0.0047
TPE2
R11 4.7k
RV3 10k(B)
REC LEVEL
-6dB
R12 4.7k
L1 470uH
R13 100
C13 0.0033
R14 2.7k
R16 6.8k
C16 0.01
C9 0.047
R15 3.3k
C15 47P
IC5-1
R43 33(1/4W)
R44 33(1/4W)
C18 0.47/25V
C24 47/16V
C25 47/16V
-0.5dB
R19 2.2k
TP3
C19 470p
-31dB
CP1 BIAS TRAP
BIAS TRAP
TPE3
CT1
BIAS
CN2
CH1
CH2
CH3
CH4
HR901 PA280-3604
IC1-2
C29 0.1/35V
RV5 10k(B)
C26 47P
R22 120k(1/6W)
C27 0.0033
RV14 10k(B)
IC4,11:uPC4556 LINE AMP
R23 10k
IC4-2
R27 1k
C31 10P
C32 1/16V
R26 33k
R28 68
R29 22k
TP5
C33 0.0047
R30 4.7k
RV6 10k(B)
R31 4.7k
L2 470uH
R32 100
C34 0.0033
R33 2.7k
C37 0.01
C30 0.047
R34 3.3k
IC5-2
C36 47P
R35 6.8k
C39 0.47/25V
R38 2.2k
TP6
CP2 BIAS TRAP
C40 470p
CT2
AUDIO SIGNAL NOT PRESENCE:5V
AUDIO SIGNAL PRESENCE:0V
IC8-1
C44 0.1/35V
R85 1k (1/4W)
R46 10k
RV8 10k(B)
A+B:0V A:0.7V
R111 3.3k
D1-1 1S2835
Q5
R112 100k
C58 47/16V
C57 47/16V
R86 1k (1/4W)
R87 33(1/4W)
IC11-1
C46 10P
R51 33k
R52 1k
R88 33(1/4W)
C60 47/16V
C59 47/16V
C47 1/16V
R53 68
R54 22k
TP8
CNP7
CNP5
S3
S4
C48 0.0047
R55 4.7k
RV9 10k(B)
R56 4.7k
L3 470uH
R57 100
C49 0.0033
R58 2.7k
R60 6.8k
C52 0.01
C45 0.047
R59 3.3k
C51 47P
IC12-1
R89 33(1/4W)
R90 33(1/4W)
C54 0.47/25V
C61 47/16V
C62 47/16V
R63 2.2k
TP9
CP3 BIAS TRAP
C55 470p
CT3
RY1-1 RY1-2
R64 8.2k(1/4W)
C56 100P
A+B:-15V A:+5V
CNP3
AU IN
CH SEL
BIAS
+15V
-15V
GND
TO CPU/POWER BOARD (CN207)
C66 0.1/35V
RV11 10k(B)
C101 0.022
R68 10k
D1-2 1S2835
R113 3.3k
A+B:0V A:0.7V
Q6
R114 100k
Q5,6:2SC1623 SW
IC11-2
C68 10P
C69 1/16V
R73 68
R72 1k
R71 33k
TP11
R74 22k
C70 0.0047
R75 4.7k
RV12 10k(B)
R76 4.7k
L4 470uH
R77 100
C71 0.0033
R78 2.7k
C74 0.01
C67 0.047
R79 3.3k
IC12-2
C73 47P
R80 6.8k
C76 0.47/25V
R83 2.2k
TP12
CP4 BIAS TRAP
C77 470p
CT4
RY2-1 RY2-2
R84 8.2k(1/4W)
C78 100P
R105 22(1/2W)
R103 10k
D6 10E1
RY-1
RY-2
Q4
Q4:2SC2603 SW
R104 100k
BIAS FREQ
IC15:uPC4556 LINE AMP
R98 33(1/4W)
TP14
+12dB
R93 3.3k
C91 47P
R95 56k
IC15-2
R96 2.2k
R94 3.3k
C93 10/25V
TPE14
+25dB
C94 10/25V
D3 1S2835
C92 10/25V
R97 47k
L5 220uH
Q1
C95 10/25V
0V(15V)
Q17
Q17 DTA124XK SW
Q1,Q2 2SC1623 SW
R100 10k
R122 100k
Q2
R101 3.3k(1/4W)
Q3:2SC3070 SW
Q3
-15V (+8V)
TP19
R102 2.2k
-15V(+12V)
TPE19
R4 RD24M
C98 0.47/50V
C99 10/35V
CP5 BIAS OSC 600kHz
CP6 TRANS
C96 10/25V
L6 220uH
C97 10/25V

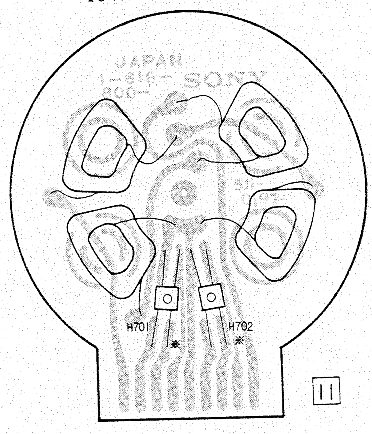
Note:

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/6 W or less unless otherwise specified.
- -w-∿- : fusible resistor.
- An underlined reference symbol denotes a tip component.
- ▬▬▬ : B+ bus.
- ▬ ▬ ▬ : B– bus.
- ☐ : adjustment for repair.
- Readings are taken under no-signal (detuned) conditions with a digital voltmeter (10 MΩ) is stop mode.
  ( ): COPY mode
- dB value is obtained when a playback of the test tape (P-4-L300) is performed.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

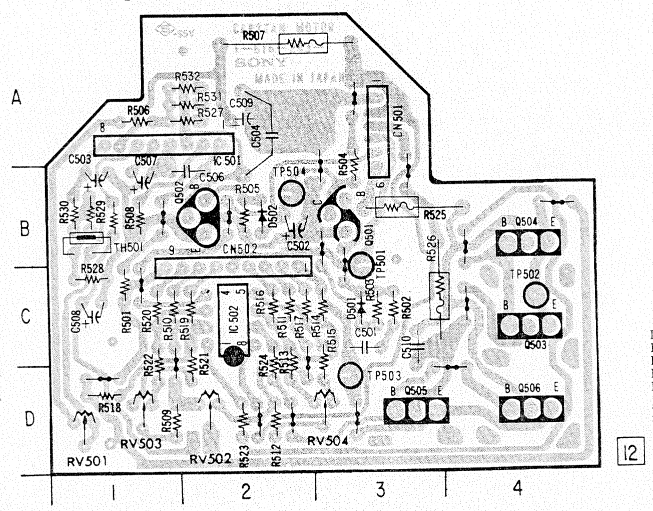
5-4. CPU/POWER BOARD *– Soldering Side –*

【STATOR BOARD】


JAPAN
1-616-
SONY
H701
H702
11

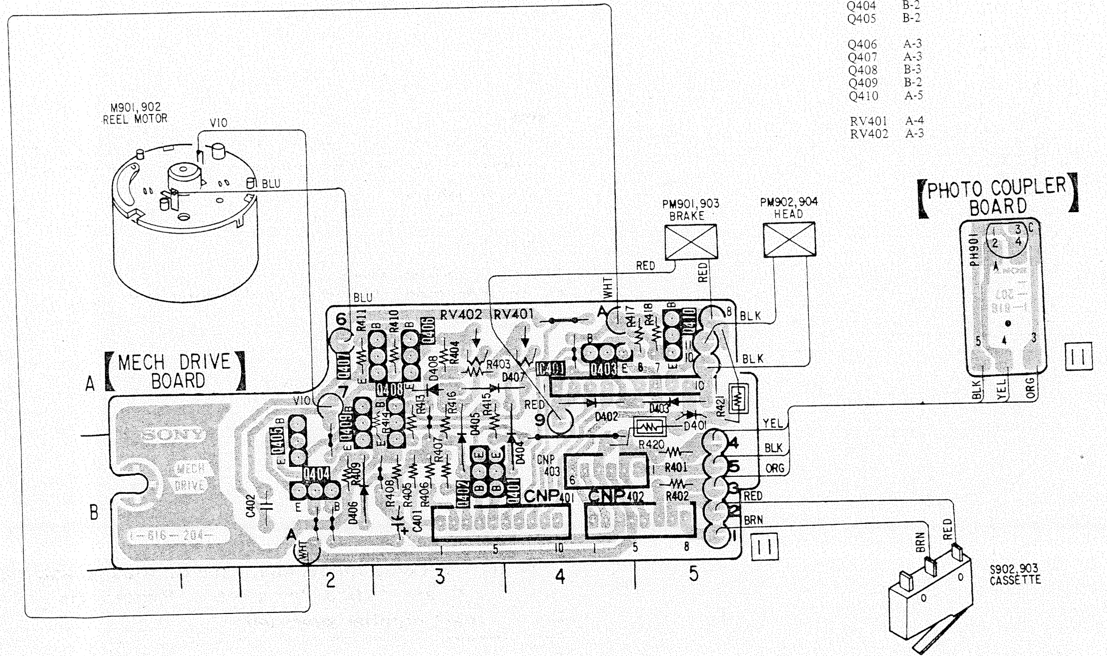
【CAPSTAN MOTOR BOARD】

D501	C-3
D502	B-2
IC501	A-1
IC502	C-2
Q501	B-3
Q502	B-2
Q503	C-4
Q504	B-4
Q505	D-3
Q506	D-4
RV501	D-1
RV502	D-2
RV503	D-1
RV504	D-3


A
B
C
D
1
2
3
4
12
SONY
MADE IN JAPAN
IC501
CN501
CN502
IC502
TH501
TP501
TP502
TP503
TP504
Q501
Q502
Q503
Q504
Q505
Q506
D501
D502
RV501
RV502
RV503
RV504
R507
R532
R531
R527
R506
R505
R525
R526
R530
R529
R528
C503
C506
C507
C509
C501
C502

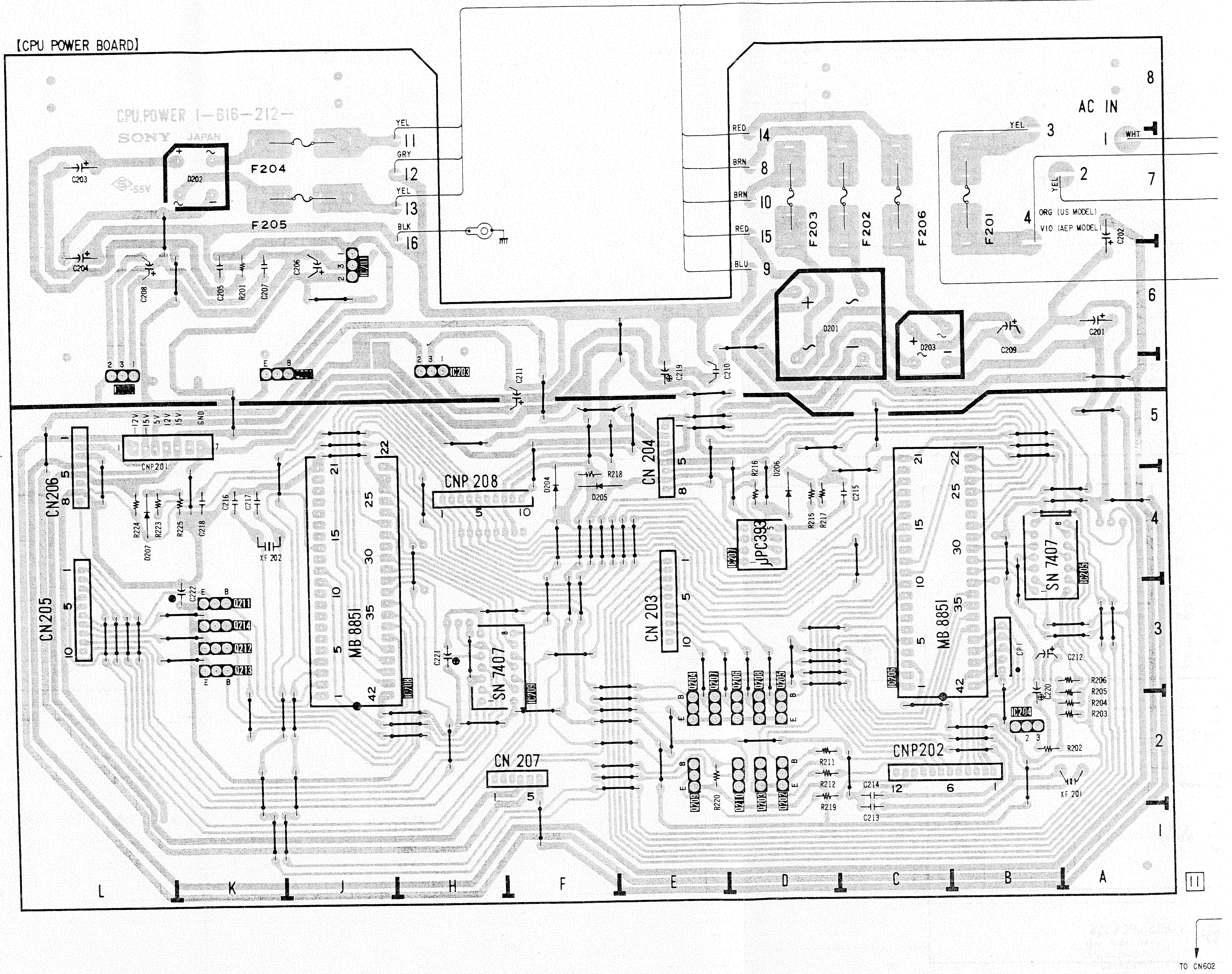
D401	B-5
D402	A-4
D403	A-5
D404	B-4
D405	B-3
D406	B-2
D407	A-3
D408	A-3
IC401	A-4
Q401	B-3
Q402	B-3
Q403	A-4
Q404	B-2
Q405	B-2
Q406	A-3
Q407	A-3
Q408	B-3
Q409	B-2
Q410	A-5
RV401	A-4
RV402	A-3

【MECH DRIVE BOARD】

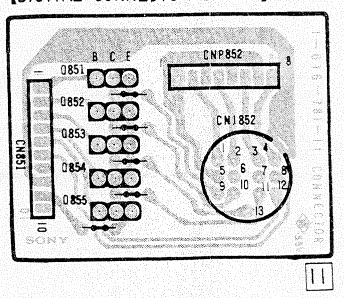

M901,902
REEL MOTOR
VIO
BLU
PM901,903
BRAKE
PM902,904
HEAD
【PHOTO COUPLER BOARD】
PH901
11
RED
WHT
BLK
YEL
ORG
BRN
RV402
RV401
IC401
CNP401
CNP402
CNP403
SONY
MECH DRIVE
1-616-284-
A
B
1
2
3
4
5
6
11
S902,903
CASSETTE

CN203	E-3	IC206	C-3
CN204	E-5	IC207	D-4
CN205	L-3	IC208	J-3
CN206	L-5	IC209	H-3
CN207	F-2		
		Q201	J-5
CNP201	L-5	Q202	D-2
CNP202	C-2	Q203	D-2
CNP208	H-4	Q204	E-2
		Q205	D-2
D201	C-6		
D202	K-7	Q206	D-2
D203	C-6	Q207	E-2
D204	F-4	Q208	D-2
D205	F-4	Q209	E-2
		Q210	D-2
D206	D-4		
D207	L-4	Q211	K-3
		Q212	K-3
IC201	J-6	Q213	K-3
IC202	L-5	Q214	K-3
IC203	H-5		
IC204	B-2		
IC205	B-4		

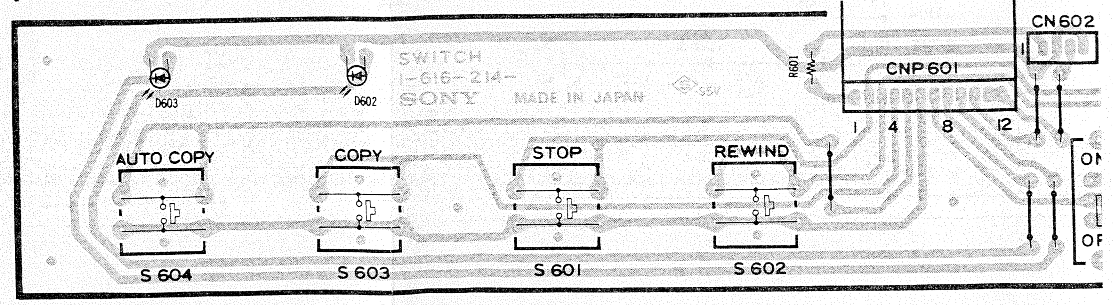
【CPU POWER BOARD】


CPU,POWER 1-616-212-
SONY JAPAN
F204
F205
F203
F202
F206
F201
D201
D202
D203
C201
C202
C203
C204
C209
C210
C211
C219
YEL 11
GRY 12
YEL 13
BLK 16
RED 14
BRN 8
BRN 10
RED 15
BLU 9
YEL 3
AC IN
WHT 1
YEL 2
ORG (US MODEL)
VIO (AEP MODEL)
4
CNP201
CNP208
CNP202
CN203
CN204
CN205
CN206
CN207
MB 8851
SN 7407
μPC393
12V
15V
5V
GND
XF201
XF202
TO CN602
A
B
C
D
E
F
H
J
K
L
1
2
3
4
5
6
7
8
11

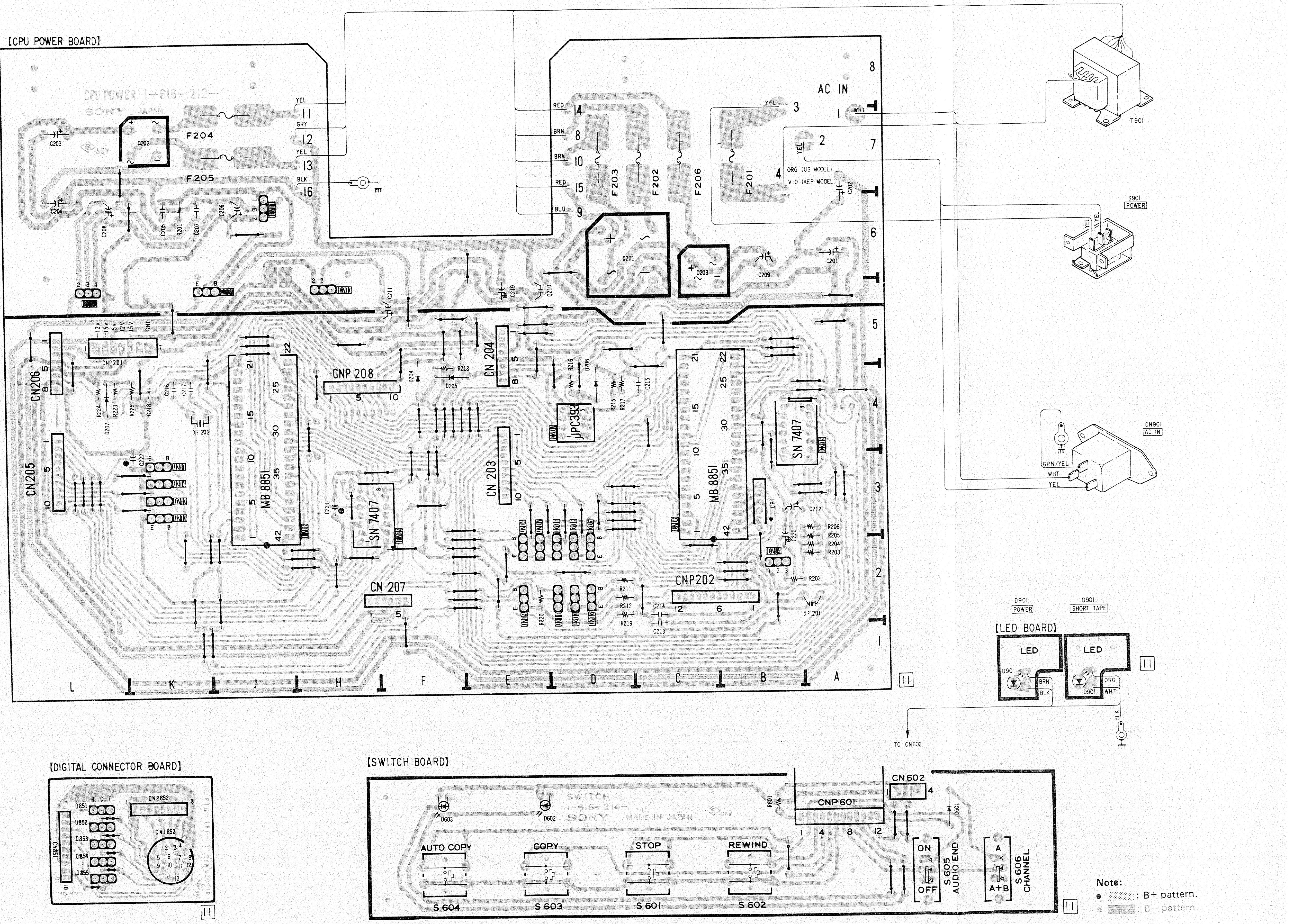
【DIGITAL CONNECTOR BOARD】

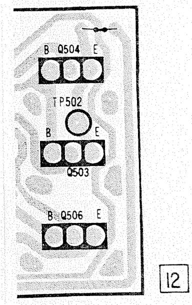

Q851
Q852
Q853
Q854
Q855
CNP852
CNJ852
CN851
SONY
11

【SWITCH BOARD】


SWITCH
1-616-214-
SONY
MADE IN JAPAN
D603
D602
R601
CN602
CNP601
AUTO COPY
COPY
STOP
REWIND
S604
S603
S601
S602
1
4
8
12

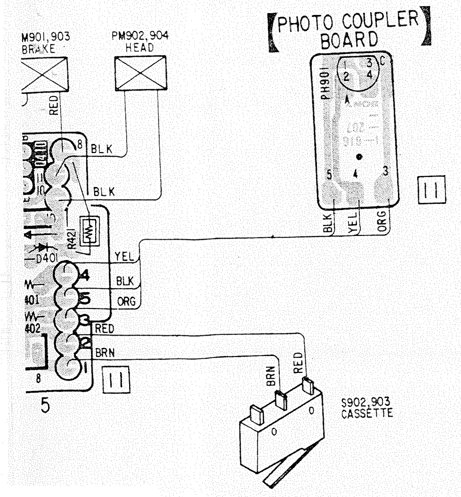
CN203	E-3	IC206	C-3
CN204	E-5	IC207	D-4
CN205	L-3	IC208	J-3
CN206	L-5	IC209	H-3
CN207	F-2		
		Q201	J-5
CNP201	L-5	Q202	D-2
CNP202	C-2	Q203	D-2
CNP208	H-4	Q204	E-2
		Q205	D-2
D201	C-6		
D202	K-7	Q206	D-2
D203	C-6	Q207	E-2
D204	F-4	Q208	D-2
D205	F-4	Q209	E-2
		Q210	D-2
D206	D-4		
D207	L-4	Q211	K-3
		Q212	K-3
IC201	J-6	Q213	K-3
IC202	L-5	Q214	K-3
IC203	H-5		
IC204	B-2		
IC205	B-4		


[CPU POWER BOARD]
CPU POWER 1-616-212-
SONY JAPAN
F204
F205
D202
C203
C204
YEL 11
GRY 12
YEL 13
BLK 16
RED 14
BRN 8
BRN 10
RED 15
BLU 9
F203
F202
F206
F201
YEL 3
WHT 1
YEL 2
4
ORG (US MODEL)
VIO (AEP MODEL)
AC IN
D201
D203
C209
C201
C202
C210
C219
C211
CNP201
CNP 208
CN 204
CN206
CN205
CN 203
CN 207
CNP202
MB 8851
SN 7407
µPC393
IC201
IC202
IC203
IC204
IC205
IC206
IC207
IC208
IC209
Q211
Q214
Q212
Q213
XF 202
XF 201
12V
15V
5V
15V
GND
L
K
J
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
11
T901
S901
POWER
CN901
AC IN
GRN/YEL
WHT
YEL
D901
POWER
D901
SHORT TAPE
[LED BOARD]
LED
LED
BRN
BLK
ORG
WHT
TO CN602
[DIGITAL CONNECTOR BOARD]
CNP852
CNJ852
CN851
Q851
Q852
Q853
Q854
Q855
[SWITCH BOARD]
SWITCH
1-616-214-
SONY
MADE IN JAPAN
CN602
CNP601
D603
D602
D601
R601
AUTO COPY
COPY
STOP
REWIND
S604
S603
S601
S602
ON
OFF
S605
AUDIO END
A
A+B
S606
CHANNEL

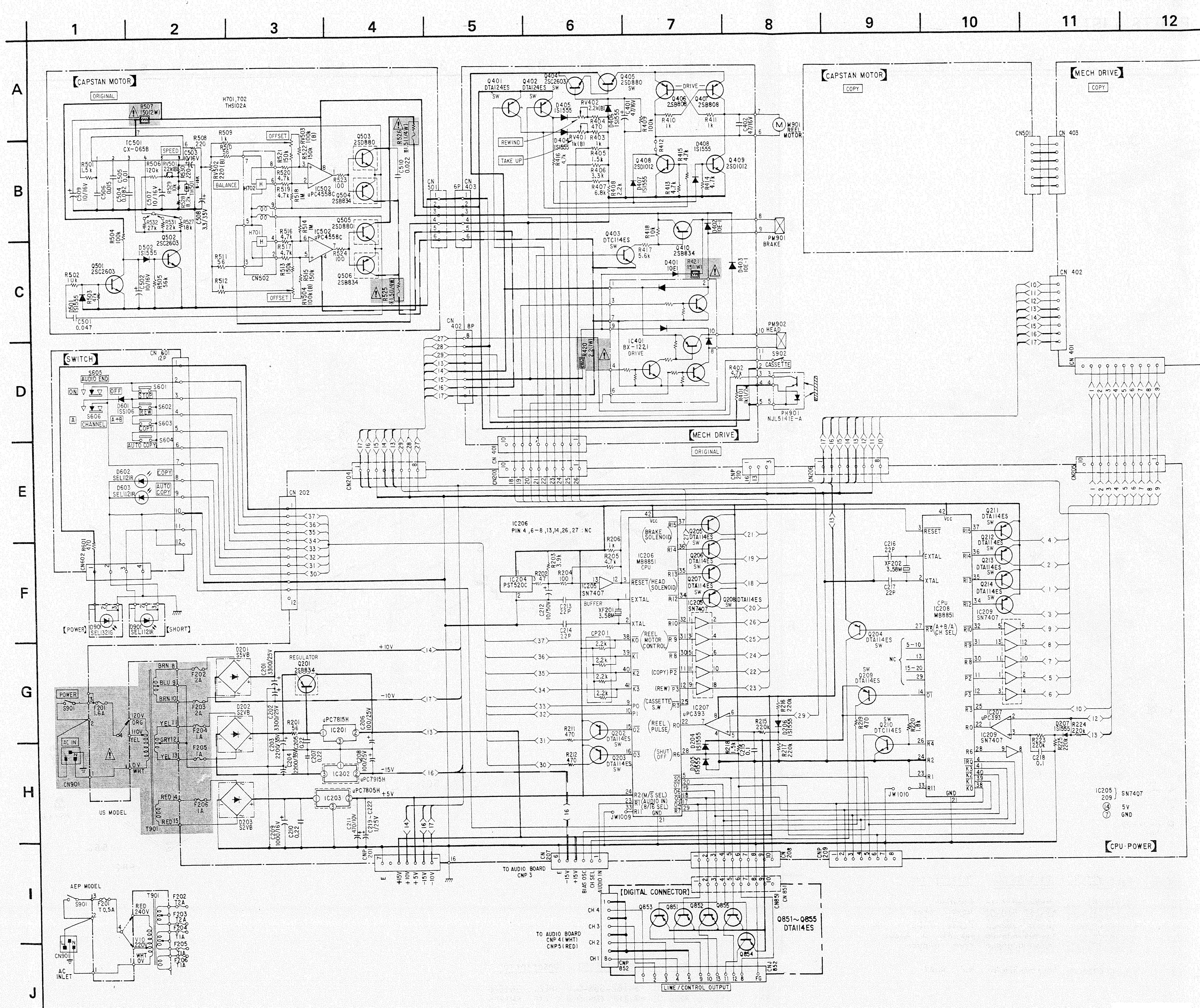

Q504
TP502
Q503
Q506
12

4

D401	B-5
D402	A-4
D403	A-5
D404	B-4
D405	B-3
D406	B-2
D407	A-3
D408	A-3
IC401	A-4
Q401	B-3
Q402	B-3
Q403	A-4
Q404	B-2
Q405	B-2
Q406	A-3
Q407	A-3
Q408	B-3
Q409	B-2
Q410	A-5
RV401	A-4
RV402	A-3


M901, 903
BRAKE
PM902, 904
HEAD
[PHOTO COUPLER BOARD]
PH901
RED
BLK
BLK
YEL
BLK
ORG
RED
BRN
BLK
YEL
ORG
S902, 903
CASSETTE
11
5

Note:
● ▨ : B+ pattern.
● ▨ : B− pattern.

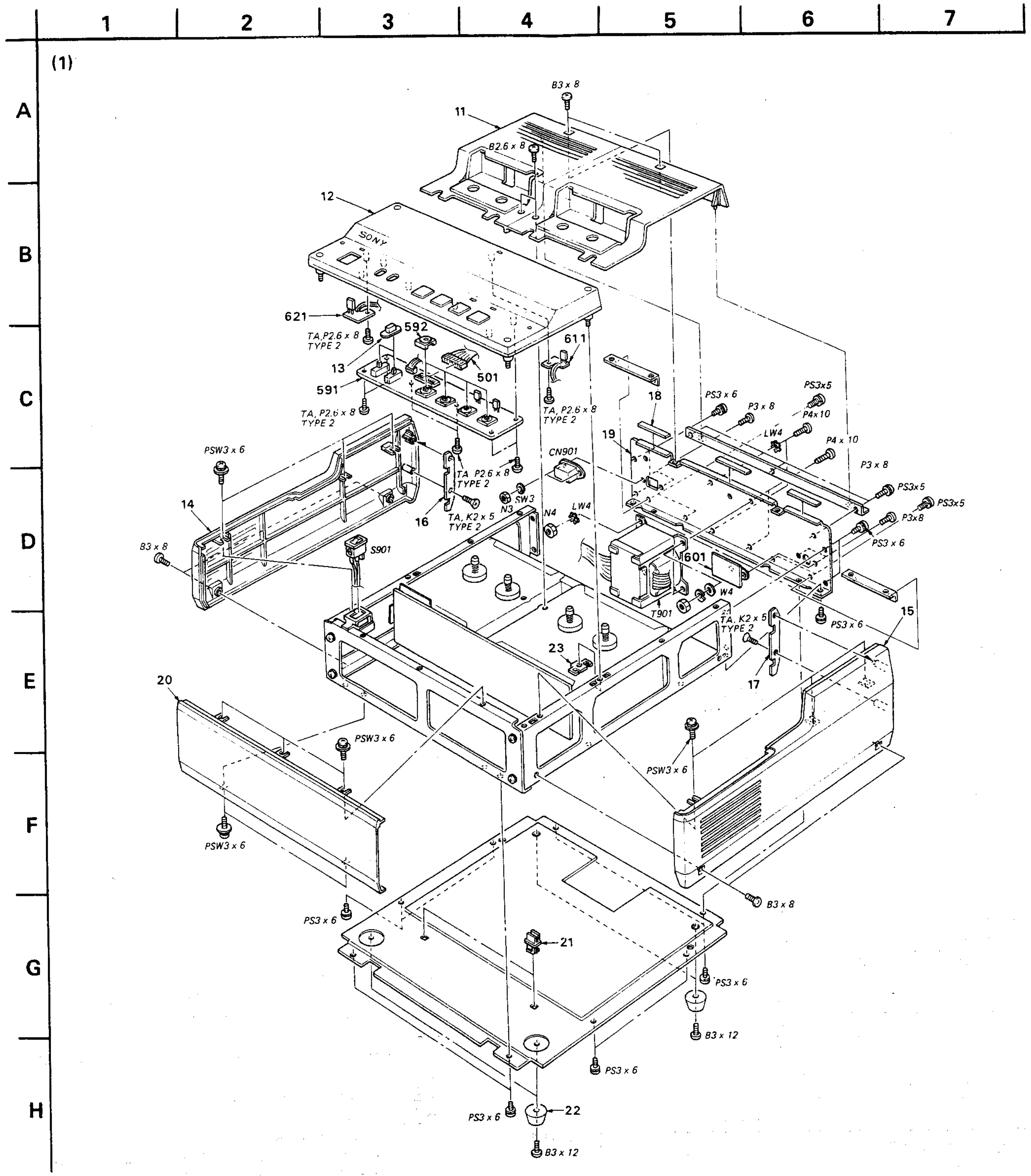

CAPSTAN MOTOR
ORIGINAL
MECH DRIVE
ORIGINAL
CAPSTAN MOTOR
COPY
MECH DRIVE
COPY
SWITCH
DIGITAL CONNECTOR
LINE/CONTROL OUTPUT
CPU·POWER
REGULATOR
US MODEL
AEP MODEL
AC INLET
TO AUDIO BOARD CNP 3
TO AUDIO BOARD CNP4 (WHT) CNP5 (RED)
M901 REEL MOTOR
M902 REEL MOTOR
PM901 BRAKE
PM902 HEAD
PM903 BRAKE
PM904 HEAD
IC501 CX-065B
IC502 μPC4558C
IC401 BX-1221 DRIVE
IC206 MB8851 CPU
IC208 MB8851 CPU
IC205 SN7407
IC207 μPC393
IC209 SN7407
IC204 PST520C
IC201 μPC7815H
IC202 μPC7915H
IC203 μPC7805H
Q851~Q855 DTA114ES
T901
S901
CN901
+10V
-10V
+15V
-15V
+5V
IC205 209 ⑭ 5V ⑦ GND
IC206 PIN 4, 6-8, 13, 14, 26, 27 : NC

Note:

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/6 W or less unless otherwise specified.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ▭ : panel designation.
- ※ : A resistor of 1.5 Ω (1/4 W) is recommended, though 1 Ω (1 W) resistor has been mounted on the initial products.
- ▬ : B+ bus.
- ▬ ▬ ▬ : B– bus.
- ▭ : adjustment for repair.

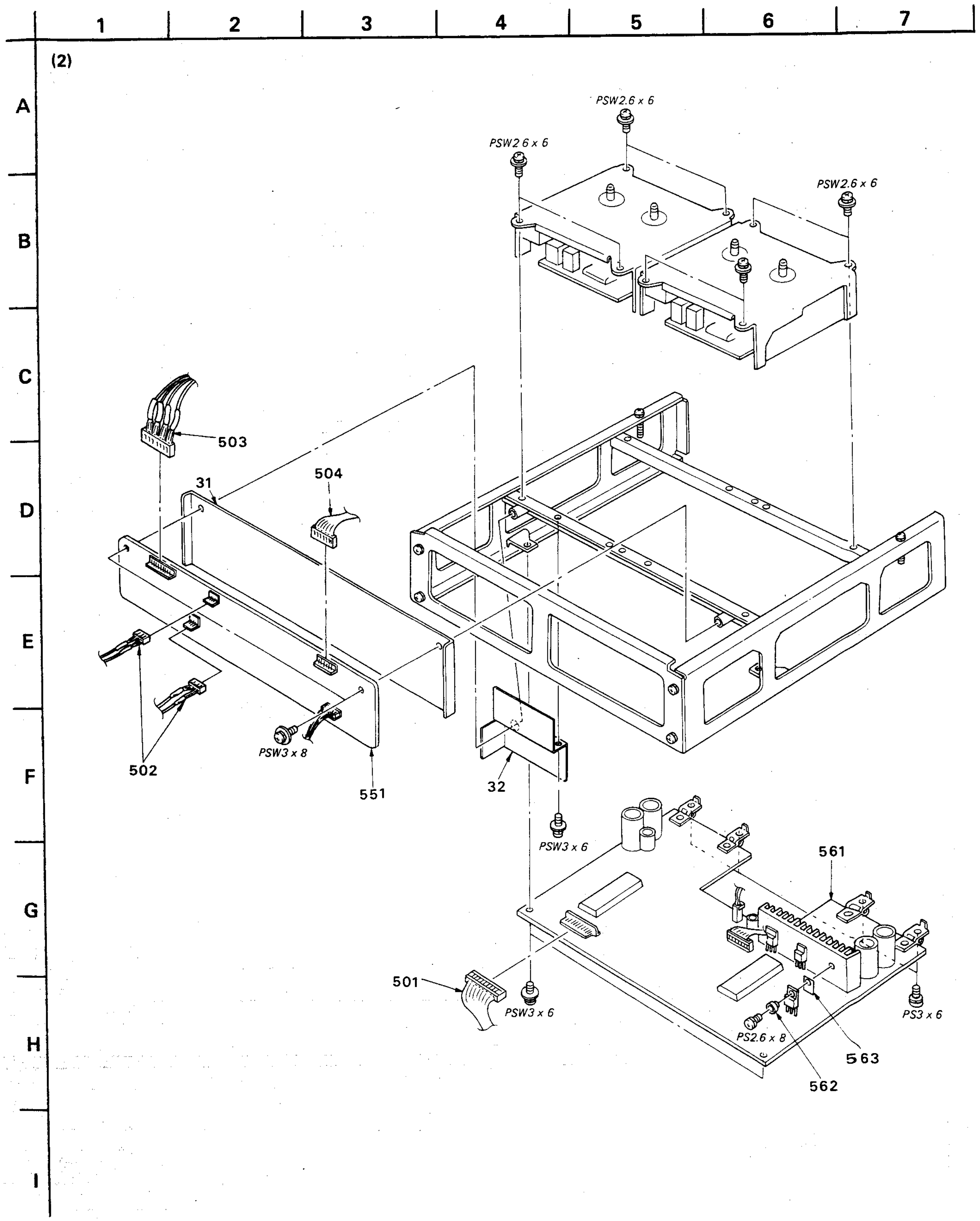
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SECTION 6
PARTS LIST

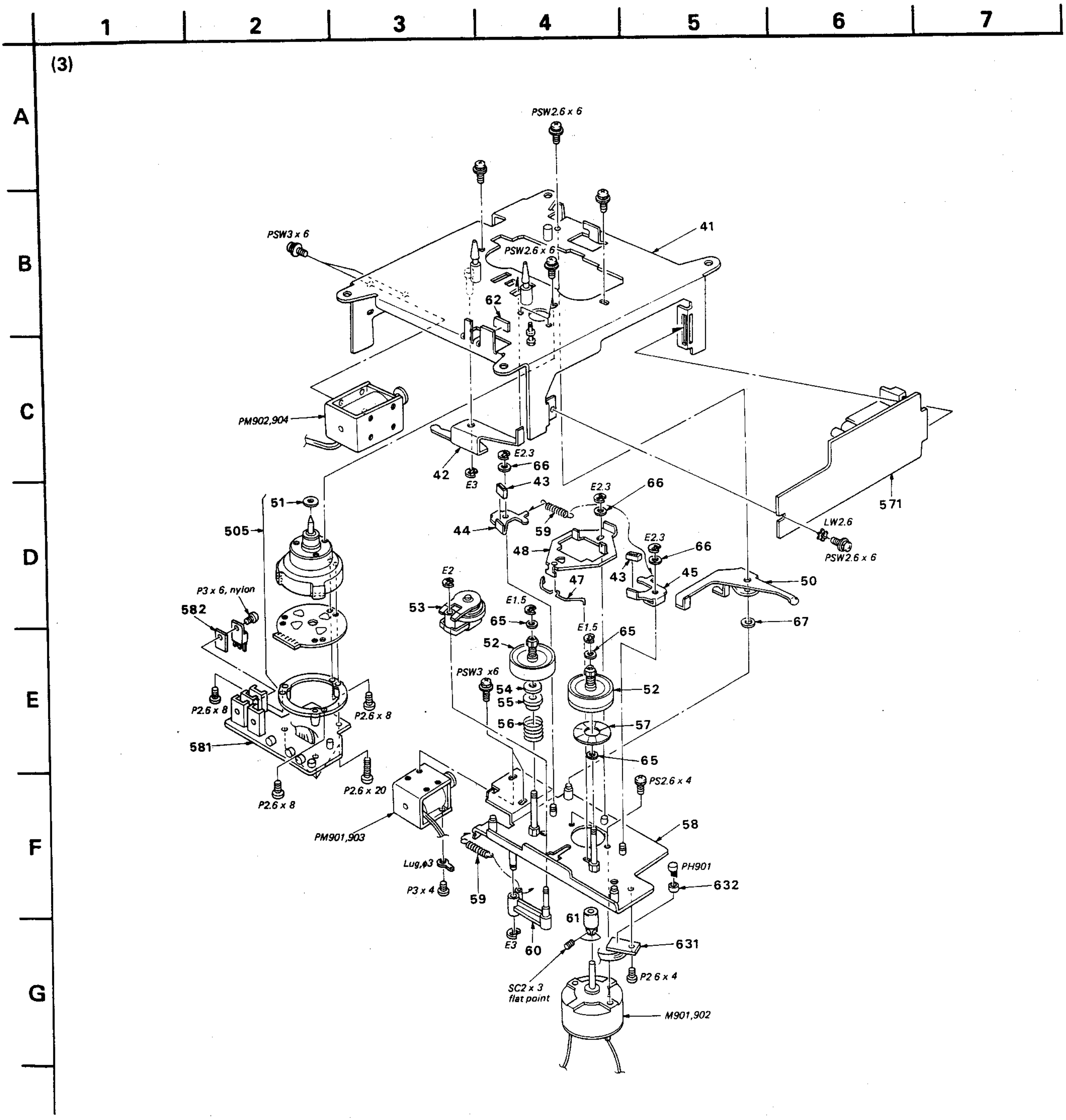

1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
(1)
B3 x 8
11
B2.6 x 8
12
SONY
621
TA,P2.6 x 8
TYPE 2
592
13
611
501
591
TA,P2.6 x 8
TYPE 2
TA,P2.6 x 8
TYPE 2
PS3 x 6
P3 x 8
PS3x5
P4x10
18
LW4
P4 x 10
19
CN901
P3 x 8
PSW3 x 6
TA P2.6 x 8
TYPE 2
SW3
N3
PS3x5
PS3x5
14
16
TA, K2 x 5
TYPE 2
N4
LW4
P3x8
PS3 x 6
B3 x 8
S901
1601
T901
W4
TA, K2 x 5
TYPE 2
PS3 x 6
15
23
17
20
PSW3 x 6
PSW3 x 6
PSW3 x 6
B3 x 8
PS3 x 6
21
PS3 x 6
B3 x 12
PS3 x 6
PS3 x 6
22
B3 x 12

Ref.No.	Part No.	Description
11	*X-3162-308-2	PLATE (REAR) ASSY, TOP
12	*A-2567-056-A	PLATE (A) ASSY, TOP
13	3-162-328-01	KNOB
14	*3-162-383-01	PLATE (LEFT), SIDE
15	*3-162-382-01	PLATE (RIGHT), SIDE
16	*3-162-334-01	PLATE (A), PAD, SIDE PLATE
17	*3-162-341-01	PLATE (B), PAD, SIDE PLATE

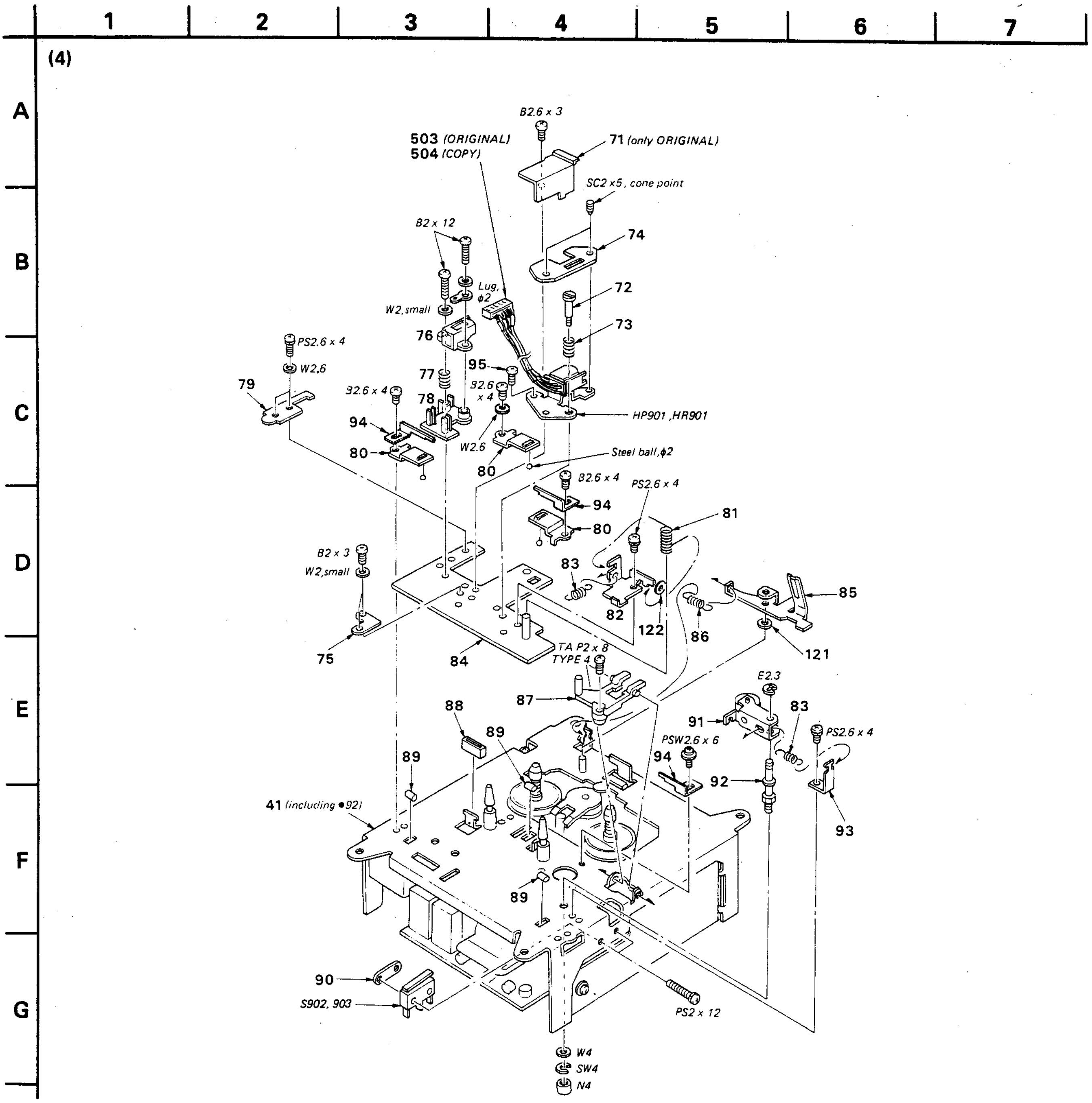
Ref.No.	Part No.	Description
18	9-911-837-XX	CUSHION
19	*3-162-410-01	PANEL, REAR
20	*3-162-380-21	PLATE, FRONT
21	*3-304-638-00	HOLDER, PC BOARD
22	X-4809-908-9	FOOT, RUBBER
23	*3-162-324-01	NUT, PLATE


1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
(2)
PSW2.6 x 6
PSW2.6 x 6
PSW2.6 x 6
503
504
31
502
PSW3 x 8
551
32
PSW3 x 6
561
501
PSW3 x 6
PS2.6 x 8
PS3 x 6
563
562

Ref.No.	Part No.	Description
31	*3-162-368-01	SHEET, SHIELD
32	*3-162-408-01	PLATE, SHIELD


1
2
3
4
5
6
7
A
B
C
D
E
F
G
(3)
PSW2.6 x 6
41
PSW3 x 6
PSW2.6 x 6
62
PM902,904
42
E3
E2.3
66
43
E2.3
66
571
51
505
44
59
48
47
E2.3
66
43
45
50
LW2.6
PSW2.6 x 6
P3 x 6, nylon
582
E2
53
E1.5
65
52
E1.5
65
67
PSW3 x6
54
55
56
52
57
65
P2.6 x 8
P2.6 x 8
581
P2.6 x 20
P2.6 x 8
PS2.6 x 4
58
PM901,903
Lug,φ3
P3 x 4
59
PH901
632
61
631
E3
60
P2 6 x 4
SC2 x 3
flat point
M901,902

Ref.No.	Part No.	Description
41	*X-3162-313-1	CHASSIS ASSY, MECHANICAL
42	*3-162-313-01	LEVER, FWD
43	3-162-366-01	RUBBER, BRAKE
44	*3-162-351-01	LEVER (LEFT), BRAKE
45	*3-162-354-01	LEVER (RIGHT), BRAKE
47	3-162-364-02	SPRING
48	*X-3162-307-3	PLATE ASSY, RELEASE, BRAKE
50	*3-162-319-01	LEVER, BRAKE
51	3-162-415-01	WASHER, THRUST
52	X-3162-317-1	TABLE ASSY, REEL
53	A-2191-025-A	PULLEY COMPLETE ASSY, IDLER
54	3-162-310-01	FELT, CLUTCH
55	3-162-356-01	RING, B.T
56	3-152-738-00	SPRING, COMPRESSION
57	3-155-352-00	REFLECTOR
58	*X-3162-303-3	CHASSIS ASSY, REEL
59	3-536-767-XX	SPRING, TENSION (28T)
60	*X-3162-304-1	ARM (1) ASSY, IDLER
61	3-162-357-01	PULLEY, MOTOR
62	9-911-848-XX	CUSHION (S)
65	3-701-437-21	WASHER d2,t0.5
66	3-701-439-21	WASHER d3,t0.5
67	3-701-444-21	WASHER d6,t0.5


1
2
3
4
5
6
7
A
B
C
D
E
F
G
(4)
B2.6 x 3
503 (ORIGINAL)
504 (COPY)
71 (only ORIGINAL)
SC2 x5, cone point
74
B2 x 12
72
Lug, ϕ2
W2,small
73
76
PS2.6 x 4
W2.6
95
77
B2.6 x 4
79
B2.6 x 4
78
94
HP901 ,HR901
W2.6
80
80
Steel ball,ϕ2
B2.6 x 4
PS2.6 x 4
94
80
81
B2 x 3
W2,small
83
85
82
122
86
75
84
121
TA P2 x 8 TYPE 4
E2.3
87
83
88
91
89
PSW2.6 x 6
PS2.6 x 4
89
94
92
41 (including •92)
93
89
90
S902, 903
PS2 x 12
W4
SW4
N4

Ref.No.	Part No.	Description
41	*X-3162-313-1	CHASSIS ASSY, MECHANICAL
71	*3-162-346-02	PLATE, SHIELD, HEAD
72	3-491-136-00	SCREW, HEAD ADJUSTING
73	3-162-395-01	SPRING, COMPRESSION
74	3-162-422-01	SPACER (1)
75	3-162-423-01	SPACER (2)
76	8-825-724-00	GUIDE, TAPE
77	3-481-272-00	SPRING, COMPRESSION
78	*3-162-376-01	BRACKET, TAPE GUIDE
79	*3-162-339-01	LEVER, LOCK
80	*3-162-312-01	SPRING
81	3-162-399-01	SPRING
82	*3-162-345-02	HOOK, SPRING
83	3-446-154-XX	SPRING, TENSION (16T)
84	*X-3162-314-1	CHASSIS ASSY (MASTER), HEAD
85	*3-162-337-01	LEVER, CASSETTE RETAINER
86	3-530-249-XX	SPRING, TENSION (16T)
87	*3-162-338-01	LEVER, CASSETTE DETECTION
88	*3-483-026-41	CUSION, RUBBER
89	3-558-448-00	ROLLER, HEAD CHASSIS
90	*3-646-476-00	NUT, PLATE
91	X-3162-306-1	PINCH ROLLER ASSY
92	*3-162-390-01	SHAFT, PINCH ROLLER
93	*3-162-344-01	BRACKET, L
94	*3-162-426-01	RETAINER, BASE
95	3-162-424-01	SCREW(M2.6X6),(+)SPECIAL HEAD
121	3-701-441-21	WASHER d4,t0.5
122	3-701-439-21	WASHER d3,t0.5

Ref.No.	Part No.	Description		
		Accessories		
	X-3701-105-0	HEAD CLEANING TIP	1	
	⚠.1-551-812-00	CORD,POWER (US MODEL)	1	
	⚠.1-534-698-XX	CORD,POWER (AEP MODEL)	1	
	*3-162-363-01	COVER, DUST	1	
	3-760-646-11	MANUAL, INSTRUCTION	1	
	3-760-646-41	MANUAL, INSTRUCTION (ONLY AEP)	1	
		Electrical Parts		
501	*1-558-063-11	CABLE, CONNECTION (2MM PITCH)		
502	*1-558-166-11	LEAD (WITH CONNECTOR) 8P		
503	*1-558-165-11	LEAD (WITH CONNECTOR) 12P		
504	*1-558-071-11	LEAD (WITH CONNECTOR) 8P		
505	1-541-316-11	MOTOR, CAPSTAN		
CN901	⚠.1-509-547-00	AC INLET		
HP901	1-543-288-11	HEAD, PLAYBACK (PA280-3604)		
HR901	1-543-289-11	HEAD, RECORD (RA280-3604)		
M901	1-541-163-00	MOTOR		
M902	1-541-163-00	MOTOR		
PM901	1-454-404-11	SOLENOID, PLUNGER		
PM902	1-454-405-11	SOLENOID, PLUNGER		
PM903	1-454-404-11	SOLENOID, PLUNGER		
PM904	1-454-405-11	SOLENOID, PLUNGER		
S901	⚠.1-553-575-21	SWITCH, SEESAW		
S902	1-554-384-00	SWITCH, MICRO		
S903	1-554-384-00	SWITCH, MICRO		
T901	⚠.1-448-284-11	TRANSFORMER, POWER (US MODEL)		
	⚠.1-448-286-11	TRANSFORMER, POWER (AEP MODEL)		
		Audio Board		
551	*A-2010-227-A	MOUNTED PCB, AUDIO		
C1	1-107-077-00	MICA 47PF	5%	50V
C2	1-107-077-00	MICA 47PF	5%	50V
C3	1-107-077-00	MICA 47PF	5%	50V
C4	1-107-077-00	MICA 47PF	5%	50V
C5	1-163-243-00	CERAMIC CHIP 47PF	5%	50V
C6	1-163-015-00	CERAMIC CHIP 0.0033MF	10%	50V
C8	1-135-070-00	TANTAL. CHIP 0.1MF	20%	35V
C9	1-136-161-00	MYLAR 0.047MF	10%	50V
C10	1-163-093-00	CERAMIC CHIP 10PF	5%	50V

Ref.No.	Part No.	Description		
C11	1-135-091-00	TANTAL. CHIP 1MF	20%	16V
C12	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C13	1-163-015-00	CERAMIC CHIP 0.0033MF	10%	50V
C15	1-163-243-00	CERAMIC CHIP 47PF	5%	50V
C16	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C18	1-135-083-00	TANTAL. CHIP 0.47MF	20%	25V
C19	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C20	1-123-821-00	ELECT 47MF	20%	16V
C21	1-123-821-00	ELECT 47MF	20%	16V
C22	1-123-821-00	ELECT 47MF	20%	16V
C23	1-123-821-00	ELECT 47MF	20%	16V
C24	1-123-821-00	ELECT 47MF	20%	16V
C25	1-123-821-00	ELECT 47MF	20%	16V
C26	1-163-243-00	CERAMIC CHIP 47PF	5%	50V
C27	1-163-015-00	CERAMIC CHIP 0.0033MF	10%	50V
C29	1-135-070-00	TANTAL. CHIP 0.1MF	20%	35V
C30	1-136-161-00	MYLAR 0.047MF	10%	50V
C31	1-163-093-00	CERAMIC CHIP 10PF	5%	50V
C32	1-135-091-00	TANTAL. CHIP 1MF	20%	16V
C33	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C34	1-163-015-00	CERAMIC CHIP 0.0033MF	10%	50V
C36	1-163-243-00	CERAMIC CHIP 47PF	5%	50V
C37	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C39	1-135-083-00	TANTAL. CHIP 0.47MF	20%	25V
C40	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C41	1-163-243-00	CERAMIC CHIP 47PF	5%	50V
C42	1-163-015-00	CERAMIC CHIP 0.0033MF	10%	50V
C44	1-135-070-00	TANTAL. CHIP 0.1MF	20%	35V
C45	1-136-161-00	MYLAR 0.047MF	10%	50V
C46	1-163-093-00	CERAMIC CHIP 10PF	5%	50V
C47	1-135-091-00	TANTAL. CHIP 1MF	20%	16V
C48	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C49	1-163-015-00	CERAMIC CHIP 0.0033MF	10%	50V
C51	1-163-243-00	CERAMIC CHIP 47PF	5%	50V
C52	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C54	1-135-083-00	TANTAL. CHIP 0.47MF	20%	25V
C55	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C56	1-107-169-00	MICA 100PF	10%	500V
C57	1-123-821-00	ELECT 47MF	20%	16V
C58	1-123-821-00	ELECT 47MF	20%	16V
C59	1-123-821-00	ELECT 47MF	20%	16V
C60	1-123-821-00	ELECT 47MF	20%	16V
C61	1-123-821-00	ELECT 47MF	20%	16V
C62	1-123-821-00	ELECT 47MF	20%	16V
C63	1-163-243-00	CERAMIC CHIP 47PF	5%	50V
C64	1-163-015-00	CERAMIC CHIP 0.0033MF	10%	50V
C66	1-135-070-00	TANTAL. CHIP 0.1MF	20%	35V
C67	1-136-161-00	MYLAR 0.047MF	10%	50V
C68	1-163-093-00	CERAMIC CHIP 10PF	5%	50V
C69	1-135-091-00	TANTAL. CHIP 1MF	20%	16V
C70	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V

NOTE:

- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:µF, PF:µµF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : µH

SEMICONDUCTORS
In each case, U : µ, for example:
UA...: µA..., UPA...: µPA..., UPC...: µPC,
UPD...: µPD...

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No.	Part No.	Description		
C71	1-163-015-00	CERAMIC CHIP 0.0033MF	10%	50V
C73	1-163-243-00	CERAMIC CHIP 47PF	5%	50V
C74	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C76	1-135-083-00	TANTAL. CHIP 0.47MF	20%	25V
C77	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C78	1-107-169-00	MICA 100PF	10%	500V
C80	1-163-113-00	CERAMIC CHIP 68PF	5%	50V
C90	1-135-070-00	TANTAL. CHIP 0.1MF	20%	35V
C91	1-163-243-00	CERAMIC CHIP 47PF	5%	50V
C92	1-123-620-00	ELECT 10MF	20%	25V
C93	1-123-620-00	ELECT 10MF	20%	25V
C94	1-123-620-00	ELECT 10MF	20%	25V
C95	1-123-620-00	ELECT 10MF	20%	25V
C96	1-123-620-00	ELECT 10MF	20%	25V
C97	1-123-620-00	ELECT 10MF	20%	25V
C98	1-123-610-00	ELECT 0.47MF	20%	50V
C99	1-131-353-00	TANTALUM 10MF	20%	35V
C100	1-123-620-00	ELECT 10MF	20%	25V
C101	1-163-033-00	CERAMIC CHIP 0.022M	10%	25V
CNP1	*1-560-465-00	PIN, CONNECTOR 12P		
CNP2	*1-560-463-00	PIN, CONNECTOR 8P		
CNP3	*1-560-469-00	PIN, CONNECTOR 6P		
CNP4	*1-560-467-00	PIN, CONNECTOR 4P		
CNP5	*1-560-467-00	PIN, CONNECTOR 4P		
CP1	1-409-407-11	COIL, BIAS TRAP		
CP2	1-409-407-11	COIL, BIAS TRAP		
CP3	1-409-407-11	COIL, BIAS TRAP		
CP4	1-409-407-11	COIL, BIAS TRAP		
CP5	1-464-530-11	OSCILLATION BLOCK, BIAS		
CP6	1-427-564-11	TRANSFORMER, INPUT/OUTPUT		
CT1	1-141-332-11	CAP, TRIMMER		
CT2	1-141-332-11	CAP, TRIMMER		
CT3	1-141-332-11	CAP, TRIMMER		
CT4	1-141-332-11	CAP, TRIMMER		
D1	8-719-100-03	DIODE 1S2835		
D3	8-719-100-03	DIODE 1S2835		
D4	8-719-107-42	DIODE RD24M-B1		
D6	8-719-200-02	DIODE 10E-2		
IC1	8-759-700-04	IC NJM2043D-D		
IC4	8-759-100-06	IC UPC4556C		
IC5	8-759-900-72	IC NE5532P		
IC8	8-759-700-04	IC NJM2043D-D		
IC11	8-759-100-06	IC UPC4556C		
IC12	8-759-900-72	IC NE5532P		
IC15	8-759-100-06	IC UPC4556C		
JR1	1-216-295-00	METAL CHIP 0	5%	1/10W
JR2	1-216-295-00	METAL CHIP 0	5%	1/10W
L1	1-410-310-11	COIL, VARIABLE		
L2	1-410-310-11	COIL, VARIABLE		
L3	1-410-310-11	COIL, VARIABLE		
L4	1-410-310-11	COIL, VARIABLE		
L5	1-410-311-11	COIL (SHIELD TYPE)		
L6	1-410-311-11	COIL (SHIELD TYPE)		

Ref.No.	Part No.	Description				
Q1	8-729-100-67	TRANSISTOR 2SC1623-L7				
Q2	8-729-100-67	TRANSISTOR 2SC1623-L7				
Q3	8-729-800-34	TRANSISTOR 2SC3070				
Q4	8-729-606-32	TRANSISTOR 2SC2603				
Q5	8-729-100-67	TRANSISTOR 2SC1623-L7				
Q6	8-729-100-67	TRANSISTOR 2SC1623-L7				
Q17	8-729-901-07	TRANSISTOR DTA124XK				
R2	1-216-029-00	METAL CHIP	150	5%	1/10W	
R3	1-247-881-00	CARBON	120K	5%	1/6W	
R4	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R7	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R8	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R9	1-216-021-00	METAL CHIP	68	5%	1/10W	
R10	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R11	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R12	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R13	1-216-025-00	METAL CHIP	100	5%	1/10W	
R14	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R15	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R16	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R19	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R21	1-216-029-00	METAL CHIP	150	5%	1/10W	
R22	1-247-881-00	CARBON	120K	5%	1/6W	
R23	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R26	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R27	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R28	1-216-021-00	METAL CHIP	68	5%	1/10W	
R29	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R30	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R31	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R32	1-216-025-00	METAL CHIP	100	5%	1/10W	
R33	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R34	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R35	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R38	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R39	1-247-713-11	CARBON	1K	5%	1/4W	
R40	1-247-713-11	CARBON	1K	5%	1/4W	
R41	⚠.1-217-393-00	FUSIBLE	33	5%	1/4W	F
R42	⚠.1-217-393-00	FUSIBLE	33	5%	1/4W	F
R43	⚠.1-217-393-00	FUSIBLE	33	5%	1/4W	F
R44	⚠.1-217-393-00	FUSIBLE	33	5%	1/4W	F
R46	1-216-029-00	METAL CHIP	150	5%	1/10W	
R47	1-247-881-00	CARBON	120K	5%	1/6W	
R48	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R51	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R52	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R53	1-216-021-00	METAL CHIP	68	5%	1/10W	
R54	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R55	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No.	Part No.	Description				
R56	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R57	1-216-025-00	METAL CHIP	100	5%	1/10W	
R58	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R59	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R60	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R63	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R64	1-247-153-00	CARBON	8.2K	5%	1/4W	
R66	1-216-029-00	METAL CHIP	150	5%	1/10W	
R67	1-247-881-00	CARBON	120K	5%	1/6W	
R68	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R71	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R72	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R73	1-216-021-00	METAL CHIP	68	5%	1/10W	
R74	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R75	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R76	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R77	1-216-025-00	METAL CHIP	100	5%	1/10W	
R78	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R79	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R80	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R83	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R84	1-247-153-00	CARBON	8.2K	5%	1/4W	
R85	1-247-713-11	CARBON	1K	5%	1/4W	
R86	1-247-713-11	CARBON	1K	5%	1/4W	
R87	⚠.1-217-393-00	FUSIBLE	33	5%	1/4W	F
R88	⚠.1-217-393-00	FUSIBLE	33	5%	1/4W	F
R89	⚠.1-217-393-00	FUSIBLE	33	5%	1/4W	F
R90	⚠.1-217-393-00	FUSIBLE	33	5%	1/4W	F
R91	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R92	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R93	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R94	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R95	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R96	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R97	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R98	⚠.1-217-393-00	FUSIBLE	33	5%	1/4W	F
R99	⚠.1-217-393-00	FUSIBLE	33	5%	1/4W	F
R100	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R101	1-247-143-00	CARBON	3.3K	5%	1/4W	
R102	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R103	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R104	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R105	1-247-200-00	CARBON	24	5%	1/2W	
R111	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R112	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R113	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R114	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R122	1-216-097-00	METAL CHIP	100K	5%	1/10W	
RV1	1-226-713-00	RES, ADJ, SOLID 100K				
RV2	1-230-523-11	RES, ADJ, SOLID 10K				
RV3	1-230-523-11	RES, ADJ, SOLID 10K				
RV4	1-226-713-00	RES, ADJ, SOLID 100K				
RV5	1-230-523-11	RES, ADJ, SOLID 10K				

Ref.No.	Part No.	Description
RV6	1-230-523-11	RES, ADJ, SOLID 10K
RV7	1-226-713-00	RES, ADJ, SOLID 100K
RV8	1-230-523-11	RES, ADJ, SOLID 10K
RV9	1-230-523-11	RES, ADJ, SOLID 10K
RV10	1-226-713-00	RES, ADJ, SOLID 100K
RV11	1-230-523-11	RES, ADJ, SOLID 10K
RV12	1-230-523-11	RES, ADJ, SOLID 10K
RV13	1-230-523-11	RES, ADJ, SOLID 10K
RV14	1-230-523-11	RES, ADJ, SOLID 10K
RV15	1-230-523-11	RES, ADJ, SOLID 10K
RV16	1-230-523-11	RES, ADJ, SOLID 10K
RY1	1-515-547-11	RELAY
RY2	1-515-547-11	RELAY

CPU/Power Board

561	*A-2012-100-A	MOUNTED PCB, CPU/POWER

Note: The Mounted PCB having this part No. does not include a Fuses and ROMs (IC206 & 208).

562	2-832-007-00	BUSHING (K), INSULATING			
563	*3-577-229-00	INSULATOR, TO-126			
	⚠1-533-131-00	HOLDER, FUSE			
	*1-535-444-00	TERMINAL			
C201	1-123-339-00	ELECT	3300MF	20%	25V
C202	1-123-339-00	ELECT	3300MF	20%	25V
C203	1-123-350-00	ELECT	2200MF	20%	35V
C204	1-123-350-00	ELECT	2200MF	20%	35V
C205	1-130-499-00	MYLAR	0.22MF	5%	50V
C206	1-123-333-00	ELECT	100MF	20%	25V
C207	1-130-499-00	MYLAR	0.22MF	5%	50V
C208	1-123-333-00	ELECT	100MF	20%	25V
C209	1-123-324-00	ELECT	1000MF	20%	16V
C210	1-130-499-00	MYLAR	0.22MF	5%	50V
C211	1-123-310-00	ELECT	470MF	20%	10V
C212	1-123-816-00	ELECT	10MF	20%	50V
C213	1-102-959-00	CERAMIC	22PF	5%	50V
C214	1-102-959-00	CERAMIC	22PF	5%	50V
C215	1-130-495-00	MYLAR	0.1MF	5%	50V
C216	1-102-959-00	CERAMIC	22PF	5%	50V
C217	1-102-959-00	CERAMIC	22PF	5%	50V
C218	1-130-495-00	MYLAR	0.1MF	5%	50V
C219	1-131-408-00	TANTALUM	1MF	10%	25V
C220	1-131-408-00	TANTALUM	1MF	10%	25V
C221	1-131-408-00	TANTALUM	1MF	10%	25V
C222	1-131-408-00	TANTALUM	1MF	10%	25V

Ref.No.	Part No.	Description
CN203	*1-558-066-11	CABLE,CONNECTION(2MM PITCH)10P
CN204	*1-558-065-11	CABLE, CONNECTION(2MM PITCH)8P
CN205	*1-558-066-11	CABLE,CONNECTION(2MM PITCH)10P
CN206	*1-558-065-11	CABLE, CONNECTION(2MM PITCH)8P
CN207	*1-558-064-11	CABLE, CONNECTION(2MM PITCH)6P
CNP201	*1-560-295-00	PIN, CONNECTOR 7P
CNP202	*1-560-465-00	PIN, CONNECTOR 12P
CNP208	*1-560-471-00	PIN, CONNECTOR 10P
CP1	1-231-517-11	BLOCK, RESISTOR 2.2KX4
D201	8-719-505-20	DIODE S5VB20
D202	8-719-502-20	DIODE S2VB20
D203	8-719-502-20	DIODE S2VB20
D204	8-719-815-55	DIODE 1S1555
D205	8-719-815-55	DIODE 1S1555
D206	8-719-815-55	DIODE 1S1555
D207	8-719-815-55	DIODE 1S1555
F201	⚠.1-532-555-00	FUSE, GLASS TUBE 1.6A (US MODEL)
	⚠.1-532-279-00	FUSE, GLASS TUBE T0.5A(AEP MODEL)
F202,203	⚠1-532-578-00	FUSE, GLASS TUBE 2A (US MODEL)
	⚠.1-532-203-00	FUSE, GLASS TUBE T2A (AEP MODEL)
F204-206	⚠1-532-536-00	FUSE, GLASS TUBE 1A (US MODEL)
	⚠.1-532-078-00	FUSE, GLASS TUBE T1A (AEP MODEL)
IC201	8-759-171-15	IC UPC7815H
IC202	8-759-179-15	IC UPC7915H
IC203	8-759-171-05	IC UPC7805H
IC204	8-759-913-42	IC PST520
IC205	8-759-974-07	IC SN7407N
IC206	8-759-922-93	IC MB8851-625M
IC207	8-759-103-93	IC UPC393C
IC208	8-759-922-93	IC MB8851-625M
IC209	8-759-974-07	IC SN7407N
Q201	8-729-283-42	TRANSISTOR 2SB834
Q202	8-729-900-61	TRANSISTOR DTA114ES
Q203	8-729-900-61	TRANSISTOR DTA114ES
Q204	8-729-900-61	TRANSISTOR DTA114ES
Q205	8-729-900-61	TRANSISTOR DTA114ES
Q206	8-729-900-61	TRANSISTOR DTA114ES
Q207	8-729-900-61	TRANSISTOR DTA114ES
Q208	8-729-900-61	TRANSISTOR DTA114ES
Q209	8-729-900-61	TRANSISTOR DTA114ES
Q210	8-729-900-80	TRANSISTOR DTC114ES
Q211	8-729-900-61	TRANSISTOR DTA114ES
Q212	8-729-900-61	TRANSISTOR DTA114ES
Q213	8-729-900-61	TRANSISTOR DTA114ES
Q214	8-729-900-61	TRANSISTOR DTA114ES

Ref.No.	Part No.	Description
R201	1-247-801-00	CARBON 56 5% 1/6W
R202	1-247-799-00	CARBON 47 5% 1/6W
R203	1-247-845-00	CARBON 3.9K 5% 1/6W
R204	1-247-807-00	CARBON 100 5% 1/6W
R205	1-247-847-00	CARBON 4.7K 5% 1/6W
R206	1-247-831-00	CARBON 1K 5% 1/6W
R211	1-247-823-00	CARBON 470 5% 1/6W
R212	1-247-823-00	CARBON 470 5% 1/6W
R215	1-247-887-00	CARBON 220K 5% 1/6W
R216	1-247-887-00	CARBON 220K 5% 1/6W
R217	1-247-887-00	CARBON 220K 5% 1/6W
R218	1-249-419-11	CARBON 1.5K 5% 1/6W
R219	1-247-823-00	CARBON 470 5% 1/6W
R220	1-247-837-00	CARBON 1.8K 5% 1/6W
R223	1-247-887-00	CARBON 220K 5% 1/6W
R224	1-247-887-00	CARBON 220K 5% 1/6W
R225	1-247-887-00	CARBON 220K 5% 1/6W
XF201	1-527-396-31	OSCILLATOR, CRYSTAL
XF202	1-527-396-31	OSCILLATOR, CRYSTAL

Mechanical Drive Board

Ref.No.	Part No.	Description
571	*A-2019-183-A	MOUNTED PCB, DRIVE, MECHANICAL
C401	1-123-821-00	ELECT 47MF 20% 16V
C402	1-123-654-00	CERAMIC 47MF 20% 16V
CNP401	*1-560-471-00	PIN, CONNECTOR 10P
CNP402	*1-560-470-00	PIN, CONNECTOR 8P
CNP403	*1-560-469-00	PIN, CONNECTOR 6P
D401	8-719-200-02	DIODE 10E-2
D402	8-719-200-02	DIODE 10E-2
D403	8-719-200-02	DIODE 10E-2
D404	8-719-815-55	DIODE 1S1555
D405	8-719-815-55	DIODE 1S1555
D406	8-719-815-55	DIODE 1S1555
D407	8-719-815-55	DIODE 1S1555
D408	8-719-815-55	DIODE 1S1555
IC401	8-741-122-10	IC BX-1221
Q401	8-729-900-63	TRANSISTOR DTA124ES
Q402	8-729-900-63	TRANSISTOR DTA124ES
Q403	8-729-900-80	TRANSISTOR DTC114ES
Q404	8-729-606-32	TRANSISTOR 2SC2603
Q405	8-729-288-02	TRANSISTOR 2SD880
Q406	8-729-800-83	TRANSISTOR 2SB808
Q407	8-729-800-83	TRANSISTOR 2SB808
Q408	8-729-811-24	TRANSISTOR 2SD1012
Q409	8-729-811-24	TRANSISTOR 2SD1012
Q410	8-729-283-42	TRANSISTOR 2SB834

Ref.No.	Part No.	Description				
R401	1-244-873-00	CARBON	1K	5%	1/2W	
R402	1-247-847-00	CARBON	4.7K	5%	1/6W	
R403	1-247-831-00	CARBON	1K	5%	1/6W	
R404	1-247-823-00	CARBON	470	5%	1/6W	
R405	1-249-419-11	CARBON	1.5K	5%	1/6W	
R406	1-247-843-00	CARBON	3.3K	5%	1/6W	
R407	1-247-851-00	CARBON	6.8K	5%	1/6W	
R408	1-249-421-11	CARBON	2.2K	5%	1/6W	
R409	1-247-879-00	CARBON	100K	5%	1/6W	
R410	1-247-831-00	CARBON	1K	5%	1/6W	
R411	1-247-831-00	CARBON	1K	5%	1/6W	
R413	1-247-847-00	CARBON	4.7K	5%	1/6W	
R414	1-247-847-00	CARBON	4.7K	5%	1/6W	
R415	1-247-847-00	CARBON	4.7K	5%	1/6W	
R416	1-247-847-00	CARBON	4.7K	5%	1/6W	
R417	1-247-849-00	CARBON	5.6K	5%	1/6W	
R418	1-249-429-11	CARBON	10K	5%	1/6W	
R420	⚠.1-212-364-00	METAL OXIDE	2.2	5%	1W	F
R421	⚠.1-212-374-00	METAL OXIDE	15	5%	1W	F
RV401	1-226-707-00	RES, ADJ, SOLID 1K				
RV402	1-226-708-00	RES, ADJ, SOLID 2.2K				

Motor Drive Board

Ref.No.	Part No.	Description				
581	*A-2020-080-A	MOUNTED PCB, DRIVE, MOTOR				
582	*3-577-229-00	INSULATOR, TO-126				
C501	1-136-161-00	MYLAR	0.047MF	10%	50V	
C502	1-123-617-00	ELECT	10MF	20%	16V	
C503	1-123-617-00	ELECT	10MF	20%	16V	
C504	1-136-164-00	FILM	0.082MF	5%	50V	
C505	1-136-153-00	MYLAR	0.01MF	10%	50V	
C506	1-136-155-00	MYLAR	0.015MF	10%	50V	
C507	1-123-617-00	ELECT	10MF	20%	16V	
C508	1-123-613-00	ELECT	3.3MF	20%	35V	
C509	1-123-617-00	ELECT	10MF	20%	16V	
C510	1-136-157-00	MYLAR	0.022MF	10%	50V	
CN501	*1-558-064-11	CABLE, CONNECTION(2MM PITCH)6P				
CN502	*1-555-130-00	WIRE, PVC				
D501	8-719-815-55	DIODE 1S1555				
D502	8-719-815-55	DIODE 1S1555				
IC501	8-759-602-65	IC CX-065B				
IC502	8-759-145-58	IC UPC4558C				
Q501	8-729-606-32	TRANSISTOR 2SC2603				
Q502	8-729-606-32	TRANSISTOR 2SC2603				
Q503	8-729-288-02	TRANSISTOR 2SD880				
Q504	8-729-283-42	TRANSISTOR 2SB834				
Q505	8-729-288-02	TRANSISTOR 2SD880				
Q506	8-729-283-42	TRANSISTOR 2SB834				
R501	1-249-419-11	CARBON	1.5K	5%	1/6W	
R502	1-249-429-11	CARBON	10K	5%	1/6W	
R503	1-249-437-11	CARBON	47K	5%	1/6W	
R504	1-247-879-00	CARBON	100K	5%	1/6W	
R505	1-247-873-00	CARBON	56K	5%	1/6W	
R506	1-247-881-00	CARBON	120K	5%	1/6W	
R507	⚠.1-206-644-00	METAL OXIDE	150	5%	2W	F
R508	1-247-815-00	CARBON	220	5%	1/6W	
R509	1-247-831-00	CARBON	1K	5%	1/6W	
R510	1-247-801-00	CARBON	56	5%	1/6W	
R511	1-247-801-00	CARBON	56	5%	1/6W	
R512	1-247-831-00	CARBON	1K	5%	1/6W	
R513	1-247-883-00	CARBON	150K	5%	1/6W	
R514	1-247-903-00	CARBON	1M	5%	1/6W	
R515	1-247-883-00	CARBON	150K	5%	1/6W	
R516	1-247-847-00	CARBON	4.7K	5%	1/6W	
R517	1-247-847-00	CARBON	4.7K	5%	1/6W	
R518	1-247-903-00	CARBON	1M	5%	1/6W	
R519	1-247-847-00	CARBON	4.7K	5%	1/6W	
R520	1-247-847-00	CARBON	4.7K	5%	1/6W	
R521	1-247-883-00	CARBON	150K	5%	1/6W	
R522	1-247-883-00	CARBON	150K	5%	1/6W	
R523	1-247-807-00	CARBON	100	5%	1/6W	
R524	1-247-807-00	CARBON	100	5%	1/6W	
R525	⚠.1-217-377-11	FUSIBLE	1.5	5%	1/4W	F
R526	⚠.1-217-377-11	FUSIBLE	1.5	5%	1/4W	F
R527	1-249-432-11	CARBON	18K	5%	1/6W	
R528	1-247-853-00	CARBON	8.2K	5%	1/6W	
R529	1-249-429-11	CARBON	10K	5%	1/6W	
R530	1-247-815-00	CARBON	220	5%	1/6W	
R531	1-247-863-00	CARBON	22K	5%	1/6W	
R532	1-249-434-11	CARBON	27K	5%	1/6W	
RV501	1-226-773-00	RES, ADJ, METAL GLAZE 22K				
RV502	1-230-893-11	RES, ADJ, METAL GLAZE 220				
RV503	1-228-761-00	RES, ADJ, METAL GLAZE 100K				
RV504	1-228-761-00	RES, ADJ, METAL GLAZE 100K				
TH501	1-800-202-XX	THERMISTOR S-10K				

Switch Board

Ref.No.	Part No.	Description			
591	*1-616-214-11	PC BOARD, SWITCH			
592	3-162-405-01	COVER, BUTTON			
CN602	*1-558-069-11	LEAD (WITH DIP CONNECTOR)			
CNP601	*1-560-465-00	PIN, CONNECTOR 12P			
D601	8-719-911-06	DIODE 1SS106			
D602	8-719-311-21	DIODE SEL1121R			
D603	8-719-311-21	DIODE SEL1121R			
R601	1-247-823-00	CARBON	470	5%	1/6W

Ref.No.	Part No.	Description
S601	1-570-382-11	SWITCH, KEY BOARD
S602	1-570-382-11	SWITCH, KEY BOARD
S603	1-570-382-11	SWITCH, KEY BOARD
S604	1-570-382-11	SWITCH, KEY BOARD
S605	1-554-481-00	SWITCH, SLIDE
S606	1-554-481-00	SWITCH, SLIDE

Digital Connector Board

601	*1-616-781-11	PC BOARD, DIGITAL CONNECTOR
CN851	*1-558-066-21	CABLE,CONNECTION(2MM PITCH)10P
CNJ852	1-562-090-00	JACK 13P
CNP852	*1-560-463-00	PIN, CONNECTOR 8P
Q851	8-729-900-61	TRANSISTOR DTA114ES
Q852	8-729-900-61	TRANSISTOR DTA114ES
Q853	8-729-900-61	TRANSISTOR DTA114ES
Q854	8-729-900-61	TRANSISTOR DTA114ES
Q855	8-729-900-61	TRANSISTOR DTA114ES

LED Board (SHORT)

611	*1-616-208-11	PC BOARD, LED
D901	8-719-311-21	DIODE SEL1121R

LED Board (POWER)

621	*1-616-208-11	PC BOARD, LED
D901	8-719-313-21	DIODE SEL1321G

Photo Coupler Board

631	*1-616-207-11	PC BOARD, PHOTO COUPLER
632	*3-162-367-01	SPACER
PH901	8-719-751-42	DIODE NJL5141E

Stator Board

H701	8-719-800-17	DIODE THS102A
H702	8-719-800-17	DIODE THS102A